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LANDSAT-2 AND LANDSAT-3
FLIGHT EVALUATION REPORT
23 APRIL 1978 TO 23 JULY 1978

Prepared By
GE LANDSAT OPERATIONS CONTROL CENTER

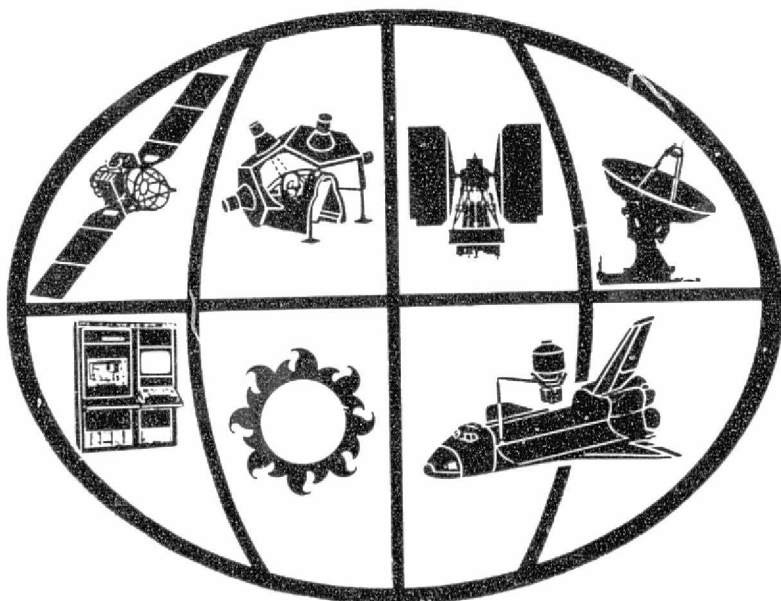
For
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Goddard Space Flight Center
Greenbelt, Maryland 20771

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(E79-10004) LANDSAT-2 AND LANDSAT-3 FLIGHT
EVALUATION REPORT, 23 APRIL TO 23 JULY 1978
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78SDS4232
1 AUGUST 1978

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Contract NAS5-21808

APPROVED: Thomas W. Winchester
Thomas W. Winchester



SPACE DIVISION
Valley Forge Space Center
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GENERAL  ELECTRIC

LANDSAT-2

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INTRODUCTION

This is the 15th report in a continuing series of documents issued at launch, and quarterly thereafter, to present flight performance analyses of the Landsat-2 spacecraft. Previously issued documents are:

Document No.	Title	Date
75SDS4215	Landsat-2 Launch and Flight Activation Evaluation Report, 22 to 26 January 1975, Launch through Orbit 50 and Orbit Adjust Operation.	21 March 1975
75SDS4228	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 January 1975 to 23 April 1975.	15 August 1975
75SDS4255	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 April 1975 to 23 July 1975.	10 October 1975
75SDS4266	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 July 1975 to 23 October 1975.	1 December 1975
76SDS4207	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 October 1975 to 23 January 1976.	29 February 1976
76SDS4248	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 January 1976 to 23 April 1976.	14 July 1976
76SDS4263	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 April 1976 to 23 July 1976.	15 October 1976
76SDS4278	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 July 1976 to 23 October 1976	30 November 1976
77SDS4204	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 October 1976 to 22 January 1977.	22 February 1977
77SDS4228	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 January 1977 to 23 April 1977.	23 May 1977
77SDS4244	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 April to 23 July 1977	22 August 1977

Document No.	Title	Date
77SDS4258	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 July 1977 to 23 October 1977	2 November 1977
78SDS4202	Landsat-1 and Landsat-2 Flight Evaluation Report, 23 October 1977 to 23 January 1978	1 February 1978
78SDS4216	Landsat-1, Landsat-2, and Landsat-3 Flight Evaluation Report, 23 January 1978 to 23 April 1978	3 May 1978

This report contains analysis of performance for Orbits 16555 to 17824 for Landsat-2.

SECTION 1
SUMMARY
LANDSAT-2 OPERATIONS

SECTION 1

SUMMARY LANDSAT-2 OPERATIONS

The Landsat-2 spacecraft was launched from the Western Test Range on 22 January 1975, at 022:17:55:51.604. The launch and orbit injection phase of the space flight were nominal and deployment of the spacecraft followed predictions. All systems continue to perform normally except Forward Scanner Pressure, Forward Scanner Pressure Telemetry, and Wideband Video Tape Recorder No. 1 (WBVTR-1). The Forward Scanner Pressure had begun leaking before launch but will not affect scanner performance. The Forward Scanner Pressure (Function 1003) telemetry became erratic in Orbit 2244 on 2 July 1975.

WBVTR-1 failed to rewind during Orbit 1021, 5 April 1975, and had intermittent operation until Orbit 2238, 2 July 1975, when normal operation was resumed. WBVTR-1 had a new anomaly in Orbit 2683 on 3 August 1975 because of failure of one of the 4 heads. As a result, it could not be used with MSS data, but performed satisfactorily with RBV data (because RBV provides a synchronizing pulse which permits data from the bad head to be isolated and eliminated). After Orbit 7181 on 20 June 1976, the recorder was used regularly in service recording RBV data until failure of a second head in Orbit 10064, 13 January 1977. All operation of WBVTR-1 had been discontinued since that date.

WBVTR-2 started to rewind but stopped prematurely in Orbit 1919, 9 June 1975, and again in Orbit 3854, 26 October 1975, with the cause unknown. Unit remains operational.

WBVTR-2 had 30% high headwheel current during playback in Orbit 9738 on 21 December 1976. The anomaly is cured by an operational procedure of toggling playback to record to playback. Frequency of anomaly is increasing. Unit remains operational.

Batteries 1, 2, 5, 6, 7 and 8 have been turned OFF one by one for restoration cycles and returned to service after a few weeks.

From 2 November 1977 to 2 February 1978, a series of orbit adjust burns were made to change the inclination angle of Landsat-2. Payload operation continued during this cycle as the ground track was maintained.

The DCS receiver was turned OFF in Orbit 15857, 4 March 1978. DCS operation has been resumed with Landsat-3.

The spacecraft continues to perform its mission satisfactorily. Table 1-1 shows cumulative in-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance Launch thru Orbit 17762 (7-19-78) Landsat-2

RBV	Total Scenes Imaged	2699
	Total Area Imaged (million sq. n mi.)	23.6
	ON TIME (hr.)	28.0
	ON/OFF Cycles	333
	% Real Time Images	73
	% Recorded Images	27
MSS	Total Scenes Imaged	271,324
	Total Area Imaged (million sq. n mi.)	2,366
	ON TIME (hr.)	2,821
	ON/OFF Cycles	17,139
	% Real Time Images	79
	% Recorded Images	21
DCS	Messages at OCC	1,353,058
	Users	(Not in Use)
	ON TIME (hr.)	27,283
WPA-1	ON TIME (hr.)	106.4
	ON/OFF Cycles	691
WPA-2	ON TIME (hr.)	2,495
	ON/OFF Cycles	13,863
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Time Head-Tape Contact (hr.)	121.7
	Cycles Head-Tape Contact	1,950
	ON TIME (hr.)	154
WBVTR-2	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	MFSE Count in P/B	~10
	Time Head-Tape Contact (hr.)	944.7
	Cycles Head-Tape Contact	12,595
	ON TIME (hr.)	1,196

SECTION 2
ORBITAL PARAMETERS
LANDSAT-2

SECTION 2

ORBITAL PARAMETERS

At the close of this report period, Landsat-2's ground track error was 2.28 nm (longitude at the equator). Error in longitude since launch as a function of time, orbit maintenance burns, and the Pitch Position Bias program are shown in Figure 2-1.

In order to conserve Landsat-2's remaining freon, and stretch the spacecraft longevity, the ground track control program using Pitch Position was discontinued in Orbit 17670, 13 July 1978. This program served as a mechanism for controlling ground track drift without implementing periodic maintenance orbit adjusts.

All subsequent ground track drift corrections will be accomplished by the OA subsystem. The PPB will be used to minimize pitch flywheel speed and prevent gating. Figure 2-2 shows the mean local time for the spacecraft's descending equatorial crossing. The mean local time crossings for Landsat's 2 and 3 respectively are 09:10:54 MLT and 09:31:39 MLT.

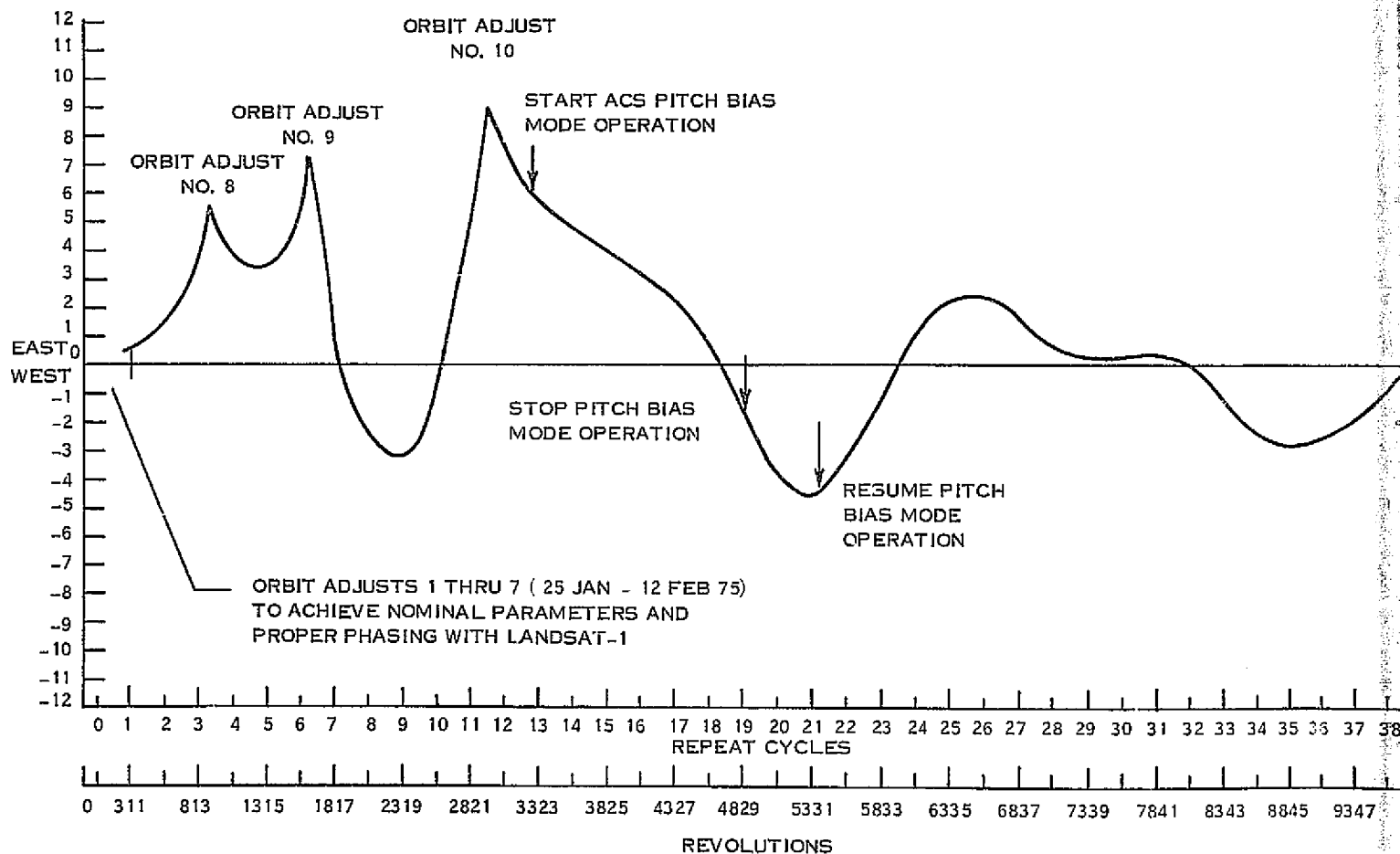
Phasing relationships between Landsat-2 and 3 are shown in Figure 2-3. Landsat-3 leads Landsat-2 at their descending equatorial crossings by 30.82 GMT minutes.

The Brouwer Mean Orbital parameters for Landsat-2 are given in Table 2-1.

Appendix B provides the spacecraft orbit reference tables for January 1978 to December 1978.

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REOLDOUT FRAME 2

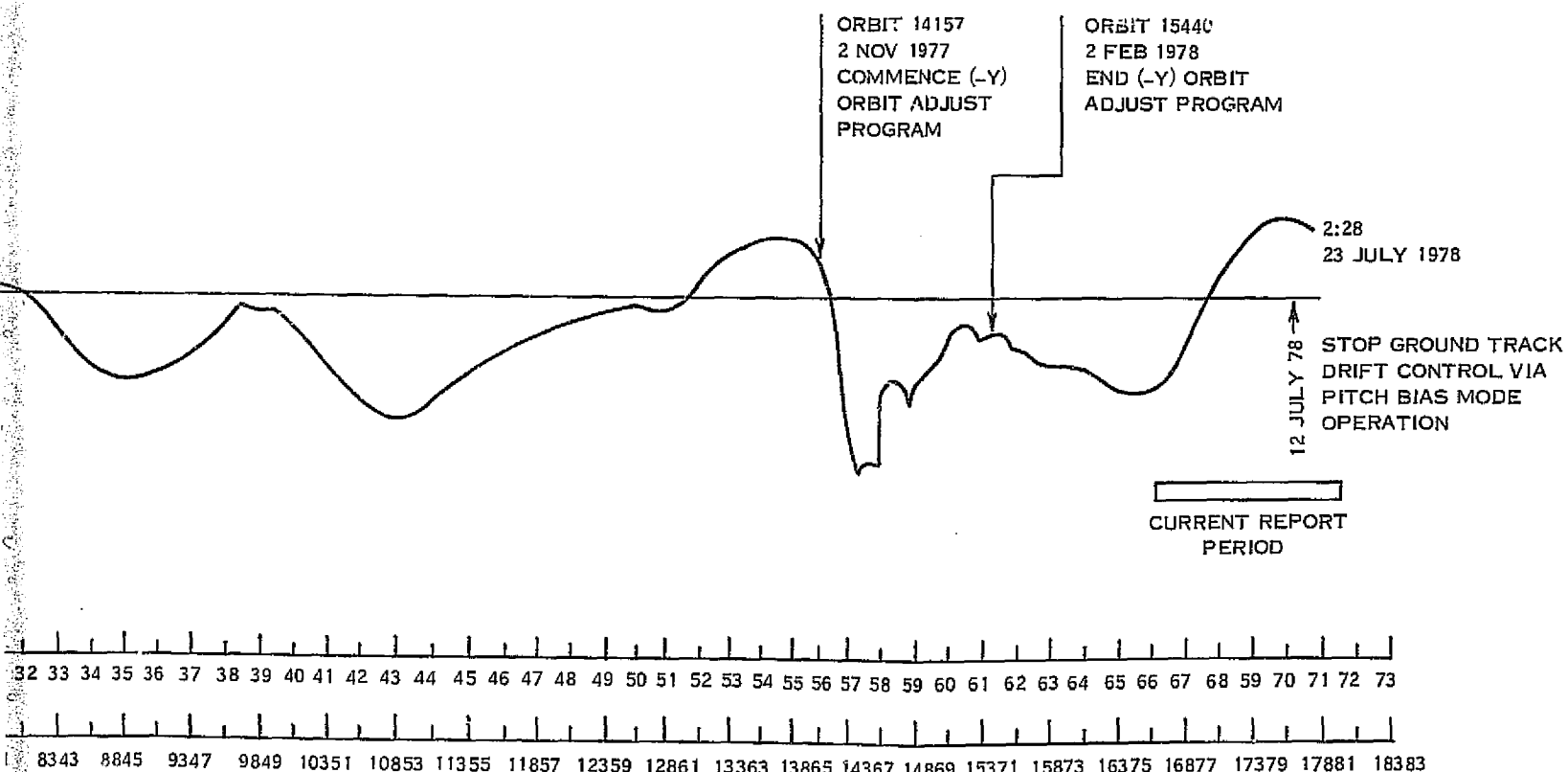
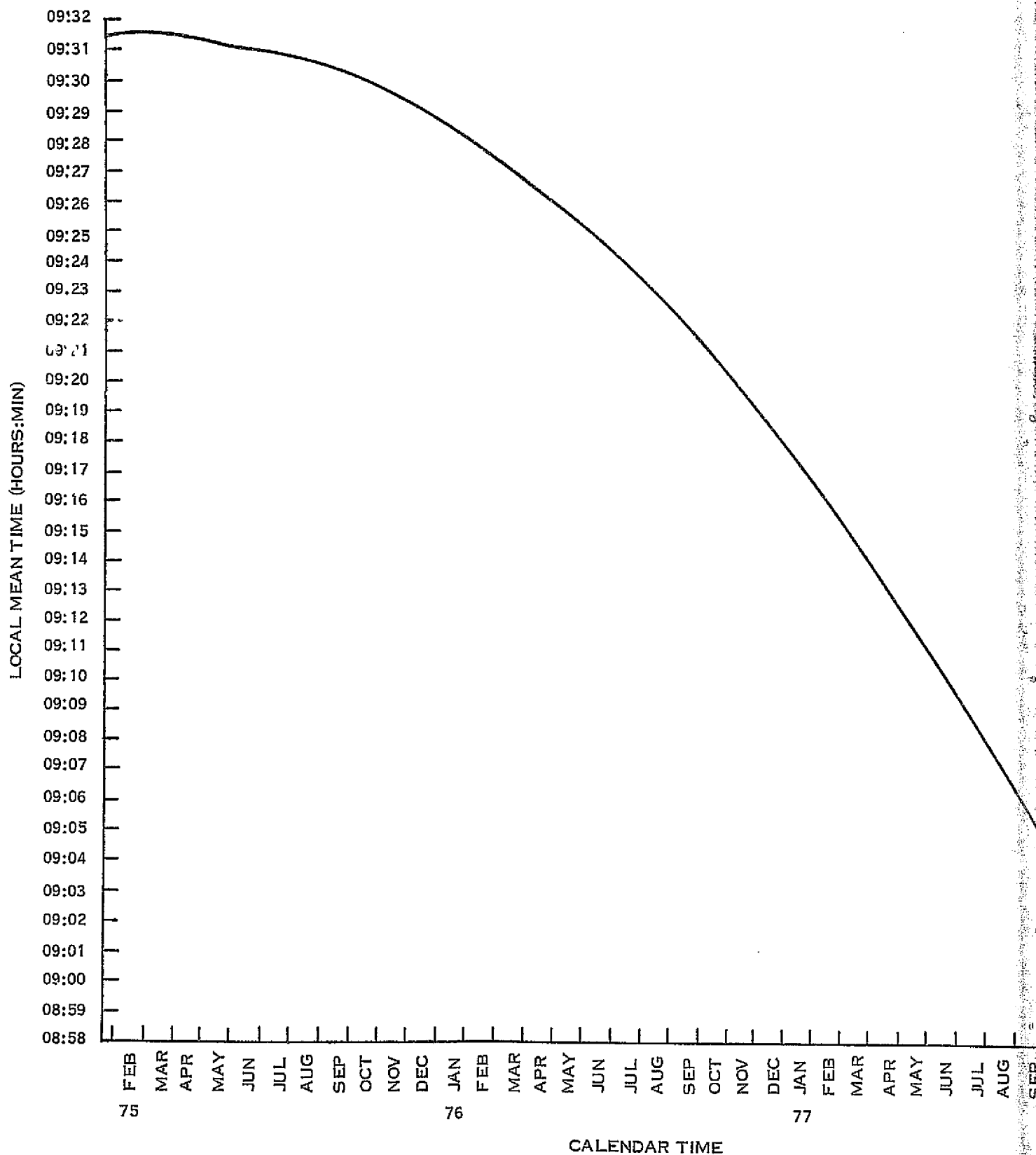


Figure 2-1. Effect of Orbit Adjusts and
Pitch Position Bias Orbit Maintenance
on Landsat-2's Ground Track

FOLDOUT FRAME 1

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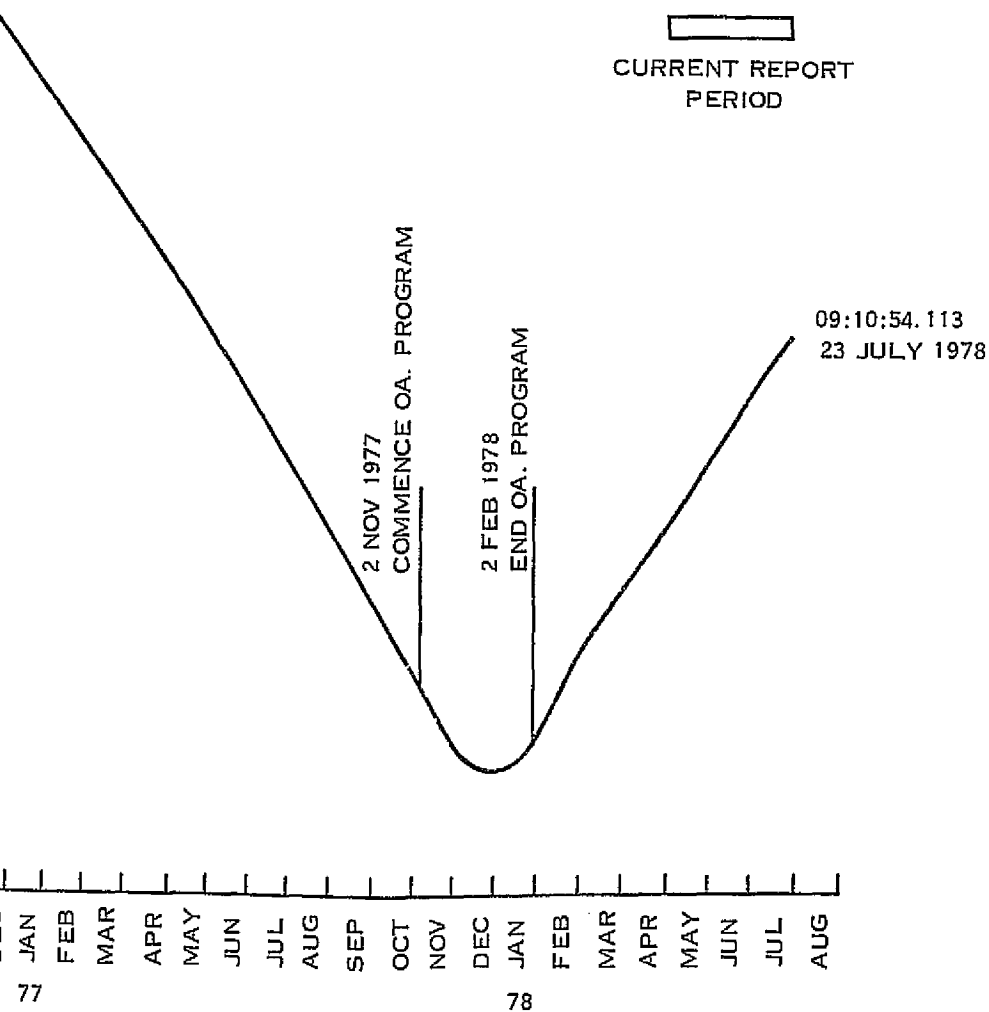


Figure 2-2. Local Mean Time of Descending Node - Landsat-2

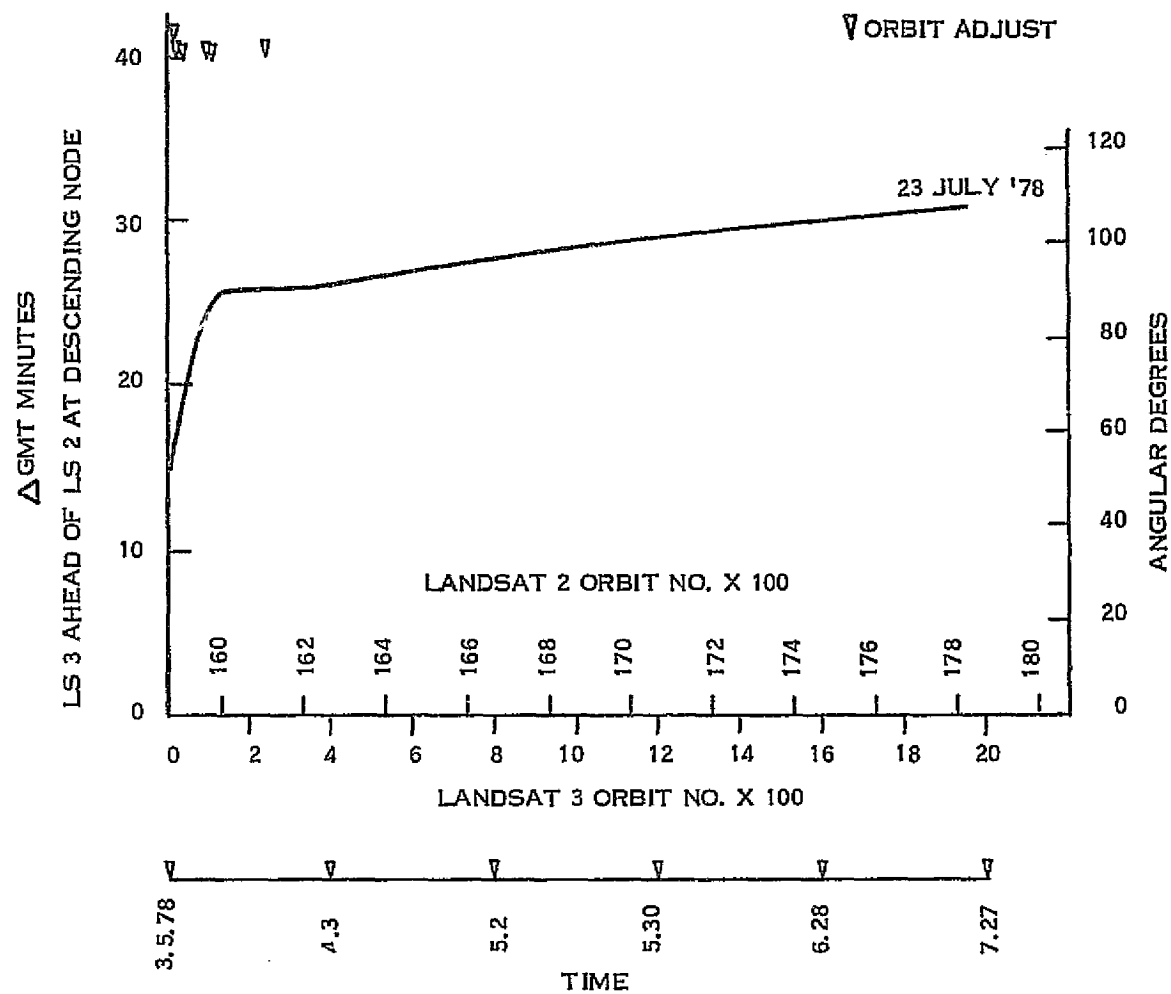


Figure 2-3. Drift in Angular Phasing Between Landsat 2 and Landsat 3

Table 2-1. Landsat-2 Brouwer Mean Orbital Parameters

Element Date	Apogee (KM)	Perigee (KM)	Inclination (Deg.)	Semi-Major Axis (KM)	Eccentricity	Anomolistic Period (Min)	Nodal Period (Min)	Argument of Perigee (Deg)	Right Ascension (Deg)	Mean Anomaly (Deg)
25 Jan 1975 ¹	915.03	901.56	99.095	7286.462	0.000925	103.165	—	272.852	86.637	139.578
6 Feb 1975 ²	916.84	898.47	99.096	7285.820	0.001260	103.151	—	256.040	99.347	134.523
24 Apr 1975	917.85	897.40	99.079	7285.788	0.001403	103.151	103.266	62.55	174.339	117.183
25 July 1975	917.45	897.68	99.071	7285.733	0.001356	103.150	103.265	166.118	264.891	13.726
23 Oct 1975	916.70	898.49	99.059	7285.762	0.00250	103.150	103.266	282.749	353.366	257.271
24 Jan 1976	917.36	897.81	99.016	7285.751	0.001342	103.150	103.266	31.621	84.584	148.179
23 Apr 1976	917.67	897.44	99.029	7285.721	0.001389	103.149	103.265	139.745	172.774	40.033
22 July 1976	916.62	898.40	99.021	7285.677	0.001251	103.148	103.264	253.964	260.924	286.054
22 Oct. 1976	916.95	898.09	99.009	7285.683	0.001251	103.148	103.264	6.744	350.795	173.119
22 Jan. 1977	917.59	897.47	98.993	7285.693	0.001381	103.149	103.265	111.579	80.587	68.155
22 Apr 1977	916.84	898.09	98.975	7285.633	0.001287	103.147	103.263	221.210	168.277	318.768
24 Jul 1977	916.47	898.46	98.967	7285.632	0.001236	103.147	103.263	334.189	257.806	205.754
23 Oct 1977	917.40	897.52	98.955	7285.627	0.001364	103.147	103.263	81.812	347.225	97.914
22 Jan 1978 ³	915.24	900.32	99.162	7285.943	0.001024	103.154	103.269	191.142	76.302	348.761
22 Apr 1978 ⁴	914.74	900.97	99.215	7286.022	0.000945	103.156	103.271	309.149	166.247	230.816
23 Jul 1978	915.52	899.91	99.206	7285.880	0.001071	103.153	103.268	62.192	258.093	304.755

1. Post Launch.

2. After the sequence of phasing maneuvers completed in Orbit 212.

3. Interim value - orbit adjust program commenced 2 Nov 1977 was in process.

4. Orbit adjust program completed 2 February 1978.

SECTION 3
POWER SUBSYSTEM (PWR)
LANDSAT-2

SECTION 3

POWER SUBSYSTEM (PWR)

The Power Subsystem on Landsat-2 has performed satisfactorily throughout this report period.

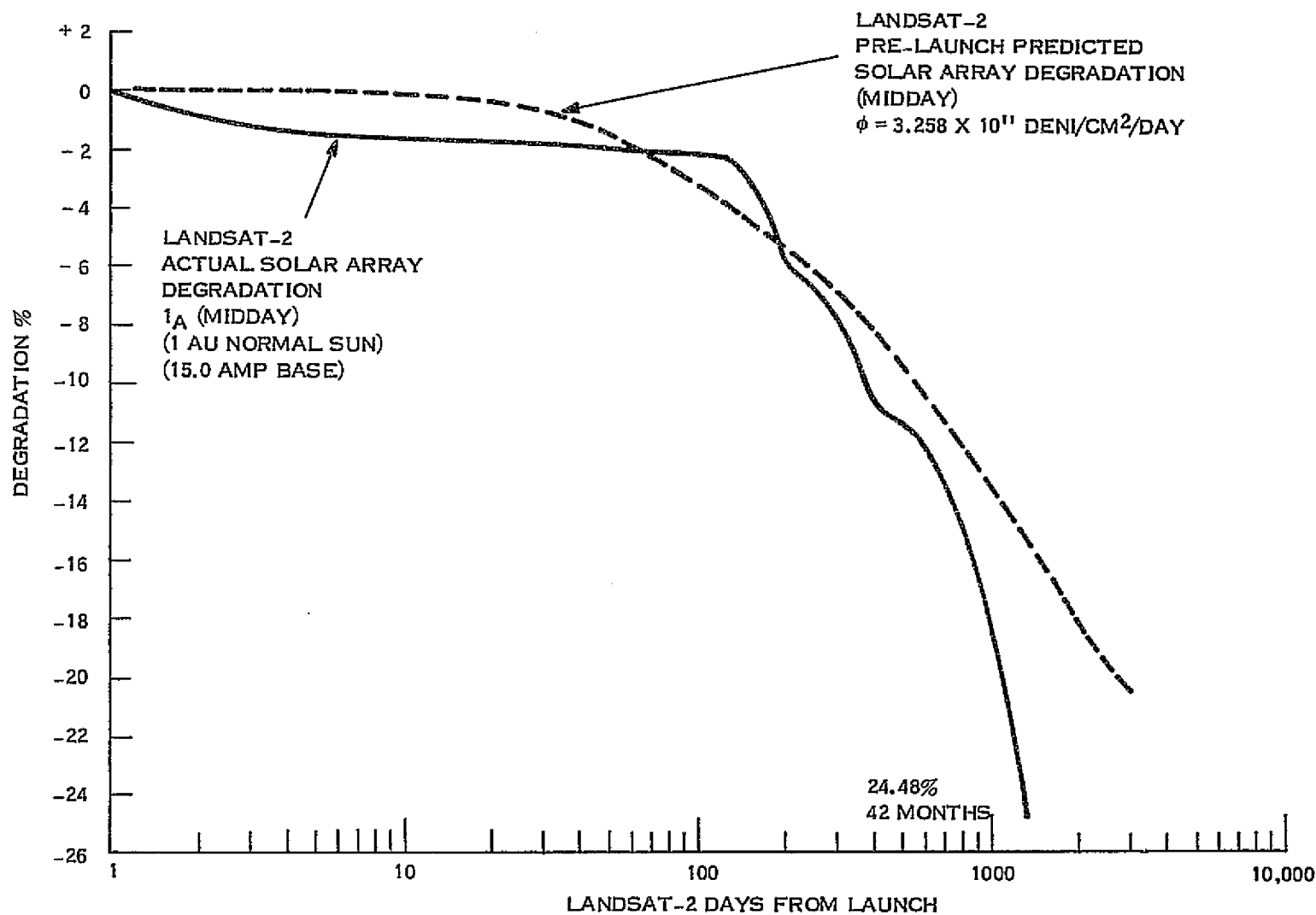
The solar arrays continued to provide excess energy above spacecraft and payload requirements and are expected to support the Landsat-2 mission through 1978. The percentage degradation of the arrays is plotted as a function of days-in-orbit in Figure 3-1, along with the pre-launch predicted array degradation. The array degradation at the end of 42 months in orbit was 24.48% which is higher than predicted. The projected values of midday array current are plotted in Figure 3-2. Here the array current is adjusted for sun intensity and array degradation, as well as sun angle. Along with the same curve is plotted the actual telemetry values observed until the end of the current report period.

The battery packs on-line ranged from 8.3 to 9.0% depth of discharge (DOD) during this report period. When any battery reached high charge-to-discharge current ratios (C/D) it was turned OFF for a restoration cycle of a few weeks, leaving 7 batteries on-line at all times. The history of these restoration cycles is shown in Table 3-1. Battery 6 was in such a restoration cycle at the end of this period. All battery-pack performance remained satisfactory. Battery voltages have been maintained within suitable limits with Landsat-2 power management procedure, excess array energy being dissipated through auxiliary loads. Temperatures ranged from 19.01°C to 23.79°C during this report period.

The power subsystem electronics have performed well during this report period with all regulated voltage stable. Table 3-2 shows major subsystem parameters and Table 3-3 shows power subsystem telemetry for selected orbits. Some parameters in Table 3-2 may be slightly different from those in Table 3-3 because Table 3-2 uses a power management time span (night followed by day), whereas the time span used in Table 3-3 is the playback period from the NBR.

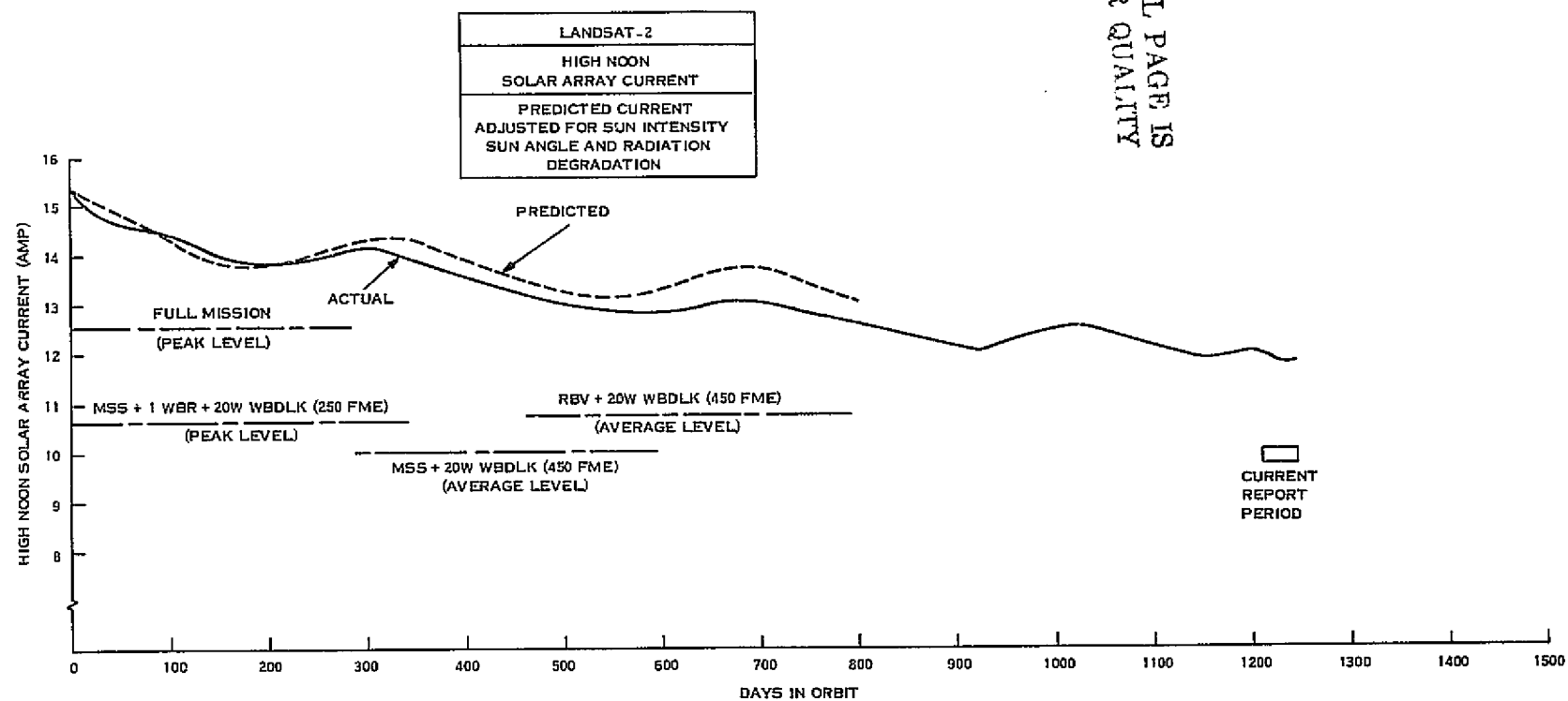
The shunt limiter on Landsat-2 has operated several times since launch and has held the solar array bus voltage at specified levels.

Figure 3-3 shows the actual variation in sun angle to orbit plane and solar panels for Landsat-2. Figure 3-4 is a prediction of the sun angle through 1979 for Landsat-2.

Figure 3-1. Landsat-2 I_A (Mid-Day) Degradation vs Days

LS-2

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3-3

Figure 3-2. Landsat-2 Mid-Day Solar Array Current

Table 3-1. Landsat-2 Battery Restoration Cycles

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
BATT. 1	OFF	ORB DATE	8029 8-20-76	11420 4-20-77	12562 7-11-77	13580 9-22-77	14870 12-24-77										
	ON	ORB DATE	8509 9-23-76	11947 5-28-77	12964 8-9-77	13670 9-29-77	15048 1-5-78										
BATT. 2	OFF	ORB DATE	12078 6-8-77														
	ON	ORB DATE	12272 6-20-77														
BATT. 3	OFF	ORB DATE															
	ON	ORB DATE															
BATT. 4	OFF	ORB DATE															
	ON	ORB DATE															
BATT. 5	OFF	ORB DATE	10249 1-26-77	15297 1-23-78													
	ON	ORB DATE	10657 2-24-77	15354 2-2-78													
BATT. 6	OFF	ORB DATE	7601 7-20-76	8591 10-29-76	9662 12-7-76	10962 3-18-77	11993 5-31-77	12271 6-20-77	12965 8-9-77	13454 9-13-77	13677 9-29-77	14230 11-8-77	14571 12-2-77	14710 12-12-77	15354 2-2-78	15083 3-13-78	17696 7-14-78
	ON	ORB DATE	7892 8-17-76	9164 11-9-76	10028 1-10-77	11311 4-12-77	12077 6-6-77	12532 7-9-77	13159 8-23-77	13466 9-15-77	13836 10-10-77	14325 11-15-77	14615 12-5-77	14755 12-16-77	15650 2-10-78	16125 3-24-78	
BATT. 7	OFF	ORB DATE	13489 9-16-77	13959 10-19-77													
	ON	ORB DATE	13570 9-21-77	14159 11-3-77													
BATT. 8	OFF	ORB DATE	13161 8-23-77														
	ON	ORB DATE	13444 9-12-77														

Table 3-2. Landsat-2 Major Power Subsystem Parameters

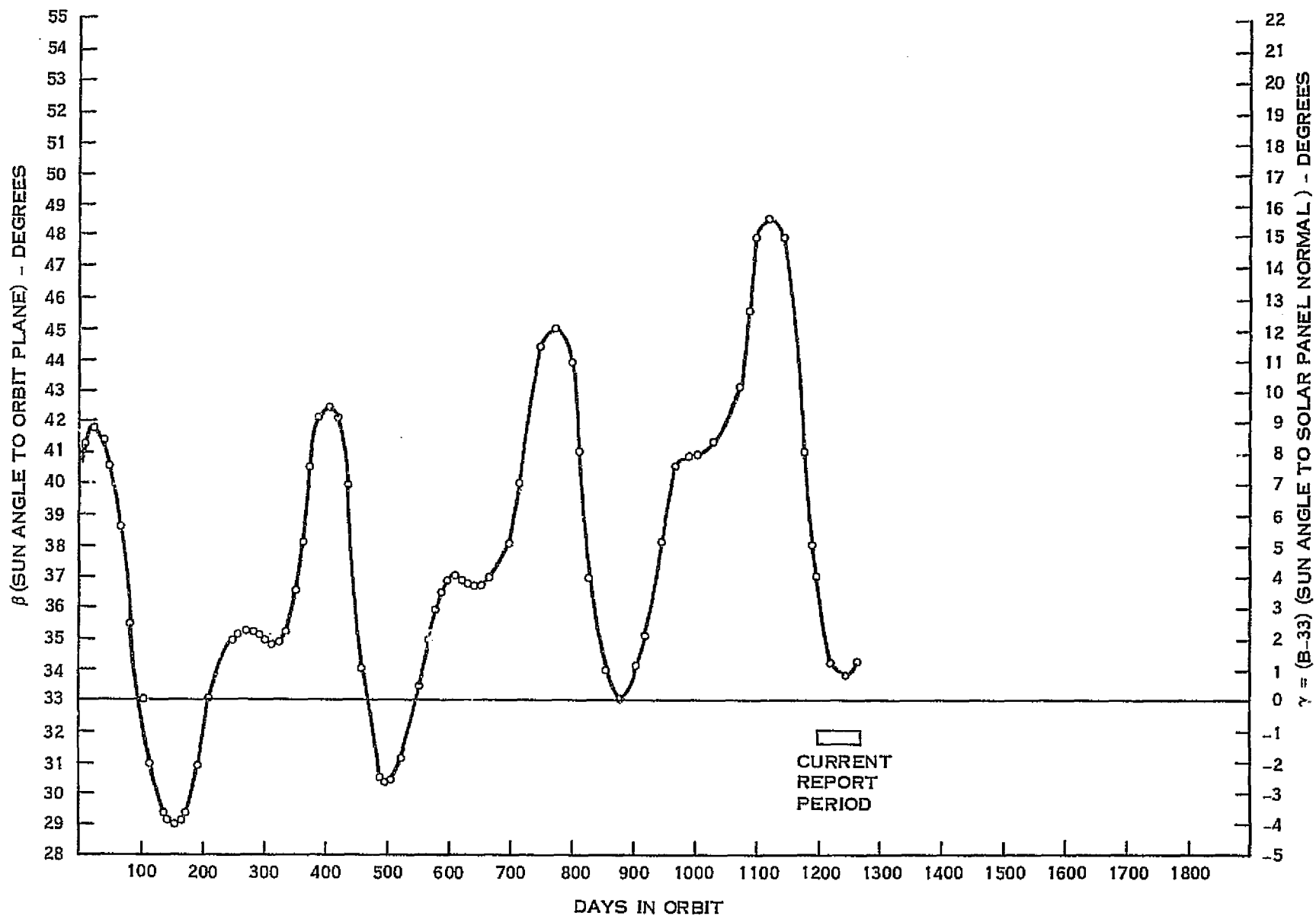
Pwr. Mgmt. Orbit No.	50	5100	10192	15211	16862	17373	17711
Batt 1 Max	33.43	32.66	32.57	32.48	32.66	32.40	33.17
2 Chge	33.40	32.63	32.54	32.46	32.63	32.37	33.23
3 Volts	33.36	32.57	32.57	32.41	32.57	32.41	33.26
4	33.45	32.68	32.59	32.51	32.59	32.43	33.28
5	33.42	32.65	32.56	32.56	32.65	32.39	33.33
6	33.41	32.64	32.56	F	32.64	32.39	F
7	33.45	32.68	32.59	32.51	32.68	32.42	33.28
8	33.45	32.68	32.59	32.50	32.68	32.42	33.27
Average	33.42	32.65	32.57	32.50	32.64	32.40	32.67
Batt 1 End-of-Night	29.32	29.06	28.98	28.55	29.15	28.89	28.98
2 Volts	29.38	29.04	28.95	28.61	29.12	28.95	28.95
3	29.32	29.07	28.89	28.64	29.15	28.89	28.98
4	29.34	29.09	28.91	28.57	29.08	28.91	29.00
5	29.40	29.06	28.97	28.63	29.14	28.89	28.97
6	29.31	28.96	28.88	F	28.96	28.79	28.54
7	29.34	29.08	29.00	28.65	29.16	28.91	29.00
8	29.34	29.00	28.91	28.57	29.08	28.91	29.00
Average	29.34	29.04	28.94	28.40	29.11	28.89	28.93
Batt 1 Chge	12.76	21.43	13.74	15.00	13.12	14.36	18.33
2 Share	11.68	11.42	11.44	13.67	12.55	12.38	14.37
3 (%)	12.24	12.48	12.41	13.64	12.89	12.34	13.90
4	11.99	11.76	11.81	13.55	12.61	11.96	13.30
5	12.84	13.24	12.95	14.48	12.00	11.27	12.41
6	13.35	14.32	15.14	F	12.68	13.70	F
7	12.90	12.97	11.74	14.88	12.36	12.47	13.76
8	12.24	11.38	10.77	13.78	11.81	11.52	12.99
Batt 1 Load	12.60	11.80	11.16	14.84	12.59	12.20	13.08
2 Share	12.70	13.94	14.14	15.41	14.02	14.13	16.01
3 (%)	12.67	13.74	13.94	13.80	13.22	13.93	15.88
4	12.44	12.48	13.00	13.80	12.62	13.30	15.05
5	12.34	12.36	9.96	13.80	11.58	11.80	13.33
6	12.70	11.56	15.27	F	12.30	11.06	F
7	12.47	12.70	11.33	14.46	11.89	11.64	13.00
8	12.04	12.02	11.21	13.88	11.79	11.93	13.64
Batt 1 Temp	21.46	21.94	22.71	21.78	19.08	21.04	22.74
2 in	20.25	19.94	20.30	19.60	19.01	20.06	20.34
3 (°C)	18.60	17.86	17.52	17.22	16.60	17.06	16.96
4	20.83	20.36	20.36	20.97	19.49	19.63	19.79
5	24.98	27.27	30.49	34.34	21.86	22.31	22.37
6	24.26	27.28	27.69	30.39	21.11	23.14	21.16
7	24.71	26.32	27.01	29.26	21.84	23.41	23.79
8	23.63	24.41	24.55	25.66	21.11	22.14	22.66
Average	22.34	23.17	23.83	25.90	20.01	21.10	21.23
S/C Reg Bus Pwr. (W)	N	149.30	154.49	143.60	130.5	136.3	132.3
Comp Load Pwr. (W)	N	24.80	6.64	0.00	0.00	0.00	0.00
P/L Reg Bus Pwr. (W)	N	9.8	9.59	9.90	9.60	9.8	9.5
C/D Ratio	1.15	1.11	1.24	1.46	1.04	1.15	1.36
Total Charge (A-M)	271.90	3.45	223.51	243.06	196.76	212.62	258.43
Total Discharge (A-M)	237.20	201.45	180.84	166.79	189.39	185.66	190.08
Solar Array (A-M)	1106	1003	939	821.90	833.6	830.7	829.3
S.A. Peak I (Amp)	16.05	14.43	13.25	11.99	12.47	12.31	12.24
Midday Array I (Amp)	N	13.72	12.86	11.92	11.77	11.77	11.61
Sun Angle (Deg)	N	8.35	10.70	14.80	35.17	33.76	35.35
Max R Pad Temp (°C)	N	63.20	58.40	53.27	56.00	57.20	55.09
Min R Pad Temp (°C)	N	-35.00	-34.40	-36.80	-35.00	-37.40	-37.40
Max L Pad Temp (°C)	N	62.15	62.15	56.92	57.69	57.69	56.92
Min L Pad Temp (°C)	N	-42.14	-39.43	-38.86	-42.86	-46.43	-44.29

N - Data Not Available

F - Unit Off

Table 3-3. Landsat-2 Power Subsystem Analog Telemetry
(Average Value for Data Received in NBTR Playback)

Func	Description	Unit	Orbits						
			50	5102	10192	15211	16862	17373	17711
6001	Batt 1 Disc I	Amp	1.01	0.74	0.52	0.66	0.70	0.61	0.70
6002	2		1.01	0.84	0.65	0.71	0.79	0.72	0.84
6003	3		1.00	0.87	0.64	0.62	0.74	0.69	0.85
6004	4		1.00	0.78	0.60	0.63	0.70	0.67	0.80
6005	5		0.99	0.78	0.47	0.63	0.64	0.59	0.71
6006*	6		1.02	0.73	0.70	F	0.66	0.55	F
6007	7		1.00	0.80	0.52	0.66	0.65	0.58	0.69
6008	8		0.97	0.75	0.52	0.52	0.65	0.60	0.72
6011	Batt 1 Chg I	Amp	0.47	0.42	0.46	0.52	0.38	0.47	0.72
6012	2		0.43	0.38	0.37	0.47	0.30	0.41	0.56
6013	3		0.45	0.42	0.40	0.47	0.37	0.41	0.54
6014	4		0.44	0.39	0.39	0.48	0.36	0.40	0.51
6015	5		0.47	0.44	0.45	0.51	0.35	0.37	0.48
6016*	6		0.49	0.47	0.49	F	0.37	0.46	F
6017	7		0.47	0.43	0.40	0.52	0.36	0.41	0.53
6018	8		0.45	0.38	0.36	0.49	0.34	0.38	0.50
6021	Batt 1 Volt	VDC	31.50	31.11	30.79	30.71	31.12	30.94	31.28
6022	2		31.48	31.09	30.80	30.68	31.10	30.93	31.30
6023	3		31.49	31.10	30.81	30.70	31.11	30.95	31.33
6024	4		31.49	31.10	30.81	30.70	31.11	30.95	31.33
6025	5		31.50	31.11	30.79	30.73	31.13	30.96	31.34
6026*	6		31.49	31.08	30.80	F	31.12	30.93	F
6027	7		31.52	31.14	30.83	30.74	31.15	30.97	31.35
6028	8		31.49	31.11	30.81	30.71	31.12	30.95	31.33
6031	Batt 1 Temp	DGC	21.59	21.91	22.67	21.73	19.04	20.98	22.79
6032	2		20.53	19.90	20.36	19.51	18.86	19.94	20.38
6033	3		18.80	17.77	17.54	17.06	16.52	17.04	17.02
6034	4		20.90	20.33	20.43	20.94	19.48	19.64	19.83
6035	5		25.16	27.18	30.52	24.20	21.86	22.26	22.38
6036	6		24.37	27.19	27.67	24.32	21.06	23.09	21.15
6037	7		24.83	26.19	26.95	29.20	21.79	23.32	23.81
6038	8		23.75	24.36	24.49	25.63	21.11	22.10	22.70
6040	Rt. Pad Temp	DGC	28.96	30.90	26.11	24.98	25.70	24.75	22.58
6041	Rt. Pad VM	VDC	33.72	32.86	31.44	30.53	33.27	33.10	33.37
6042	Rt. Pad VN	VDC	33.46	32.44	31.27	21.60	32.44	32.55	32.41
6044	Lt. Pad Temp	DGC	25.56	28.22	26.41	27.99	24.57	23.75	21.32
6045	Lt. Pad VF	VDC	34.40	33.82	33.36	33.24	33.85	33.66	34.25
6046	Lt. Pad VG	VDC	34.48	33.91	33.45	33.32	33.93	33.72	34.34
6050	S/C UR Bus V	VDC	31.73	31.33	30.93	30.99	31.32	31.14	31.53
6051	S/C RG Bus V	VDC	24.57	24.58	24.57	24.58	24.58	24.58	24.58
6052	Aux Reg AV	VDC	23.36	23.44	23.44	23.44	23.44	23.44	23.44
6053	Aux Reg BV	VDC	23.37	23.44	23.43	23.44	23.44	23.44	23.44
6054	Solar I	Amp	14.81	13.40	12.25	10.57	11.62	11.58	11.31
6056	S/C RG Bus I	Amp	7.23	6.28	6.41	5.86	5.33	5.58	5.40
6058	PC Mod T1	DGC	21.67	20.77	20.08	20.37	18.76	19.39	19.42
6059	PC Mod T2	DGC	20.44	19.56	19.16	18.94	18.23	18.70	18.69
6070	P/L RG Bus V	VDC	24.61	24.00	24.59	24.59	24.59	24.60	24.61
6071	P/L UR Bus V	VDC	31.85	31.40	30.97	31.03	31.38	31.19	31.63
6073	P Aux AV	VDC	23.47	23.51	23.50	23.50	23.50	23.50	23.50
6074	P Aux BV	VDC	23.46	23.51	23.50	23.50	23.50	23.50	23.50
6075	PR Mod T1	DGC	20.84	20.32	20.82	20.23	19.55	20.21	20.30
6076	PR Mod T2	DGC	22.13	21.79	22.14	21.77	21.25	21.86	21.82
6079	Fuse Blow V	VDC	24.48	24.49	24.48	24.49	24.47	24.46	24.48
6080	Shunt 1 I	Amp	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6081	2		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6082	3		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6083	4		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6084	5		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6085	6		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6086	7		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6087	8		0.0	0.0	0.0	0.0	0.0	0.0	0.0
6100	P/L RG Bus I	Amp	0.38	0.54	0.40	0.41	0.39	0.40	0.39
Total No. Major Frames		Frm	396	785	697	725	378	371	690

Figure 3-3. Landsat Actual β and α (Paddle) Sun Angles

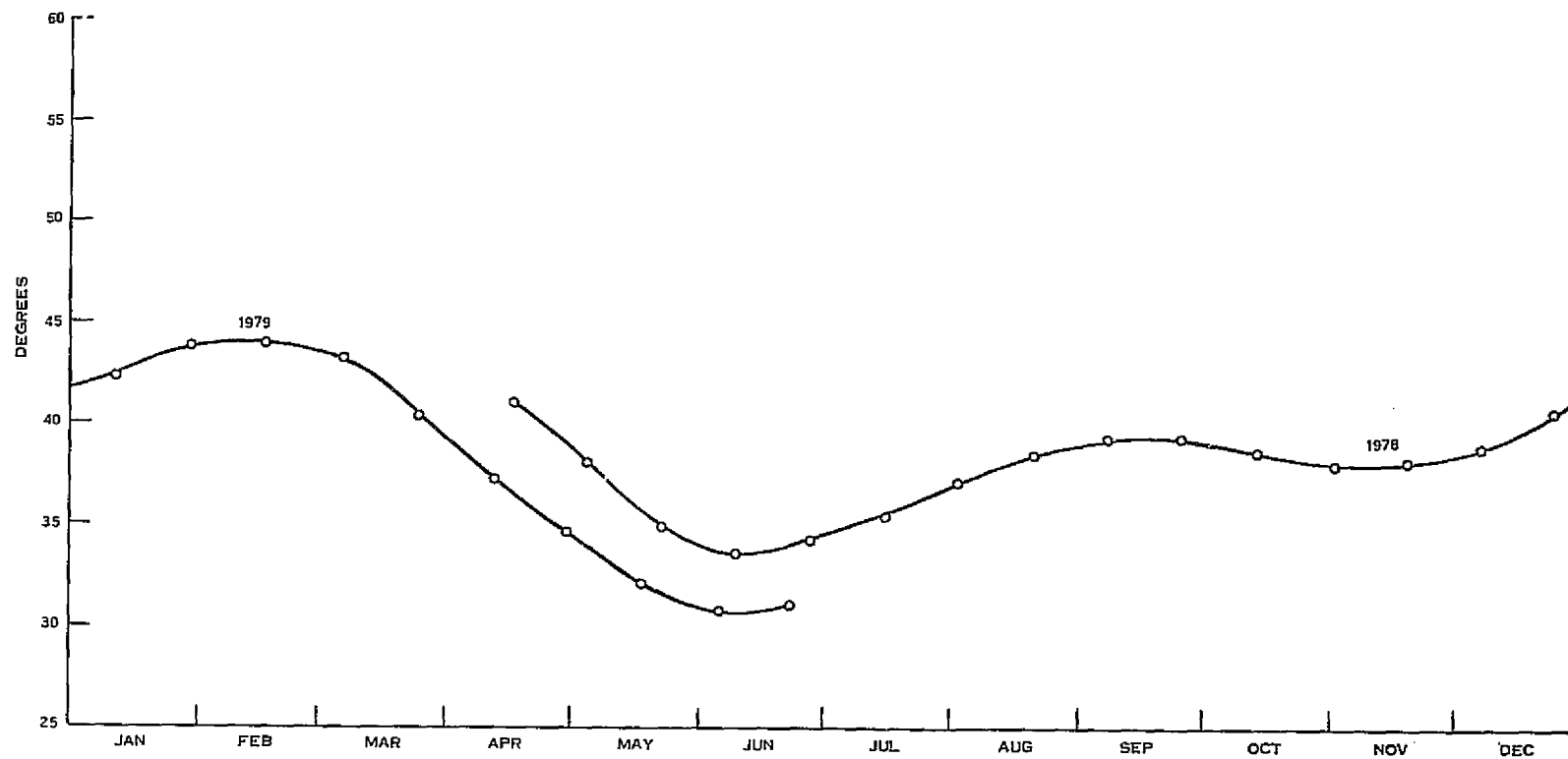


Figure 3-4. Predicted Beta Angle for LS-2 - 1977, 1978, 1979

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SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-2

SECTION 4

ATTITUDE CONTROL SUBSYSTEM

Landsat-2's Attitude Control Subsystem has performed normally since launch and has consistently maintained correct spacecraft attitude.

The Pitch Position Bias (PPB) ground track control program was initiated in September 1975. It utilizes PPB to control pitch flywheel speed and regulate pitch gating polarity and frequency in lieu of periodic maintenance orbit adjusts (OA) to correct ground track drift.

Higher solar activity due to the sun's 11-year cycle increased spacecraft drag and an increasing number of minus Pitch gates per day were required to control the ground track. Following the orbit adjust program in February 1978, there was a reduced amount of freon remaining. Since freon is imperative to spacecraft longevity, the ground track control program was discontinued in order to conserve freon. PPB will still be used to minimize pitch flywheel speed and prevent pitch gating. Consequently, all future ground track corrections will be accomplished with the OA subsystem.

The data points plotted in Figure 4-1 show the decline of freon usable impulse (I_R) from the conclusion of the OA program (February 1978) to 9 July 1978. When a least squares regression was performed on these data points, the resulting curve predicted freon exhaustion by April 1980. If the ground track control program were continued with ever increasing pitch gates, freon exhaustion is predicted to occur in November 1979. With the ground track program discontinued, freon life is predicted to extend through May 1981 (Ref. Figures 4-1 and 4-2).

Table 4-1 summarizes the Pitch Position Bias sequences implemented this quarter and Figure 2-1 in Section 2 shows the effects of Pitch gating control on the spacecraft's orbital ground track drift.

Figure 4-3 shows Landsat-2's gating pattern since launch and Figure 4-4 presents the cumulative gating history over the same period.

RMP2, commanded into operation shortly after ACS acquisition as the primary control of the Yaw subsystem, has functioned normally.

RMP1 was not exercised during this report period.

Both solar array drives functioned normally and both solar arrays maintained correct sun alignment.

Typically, flywheel duty cycles have averaged seven percent or less. Pitch and Yaw flywheel speeds have averaged less than -150 RPM while the Roll flywheels have averaged 760 RPM. Sun transient response in the dual scanner mode is normal.

Tables 4-2, 4-3 and 4-4 show typical ACS telemetry values; all are nominal.

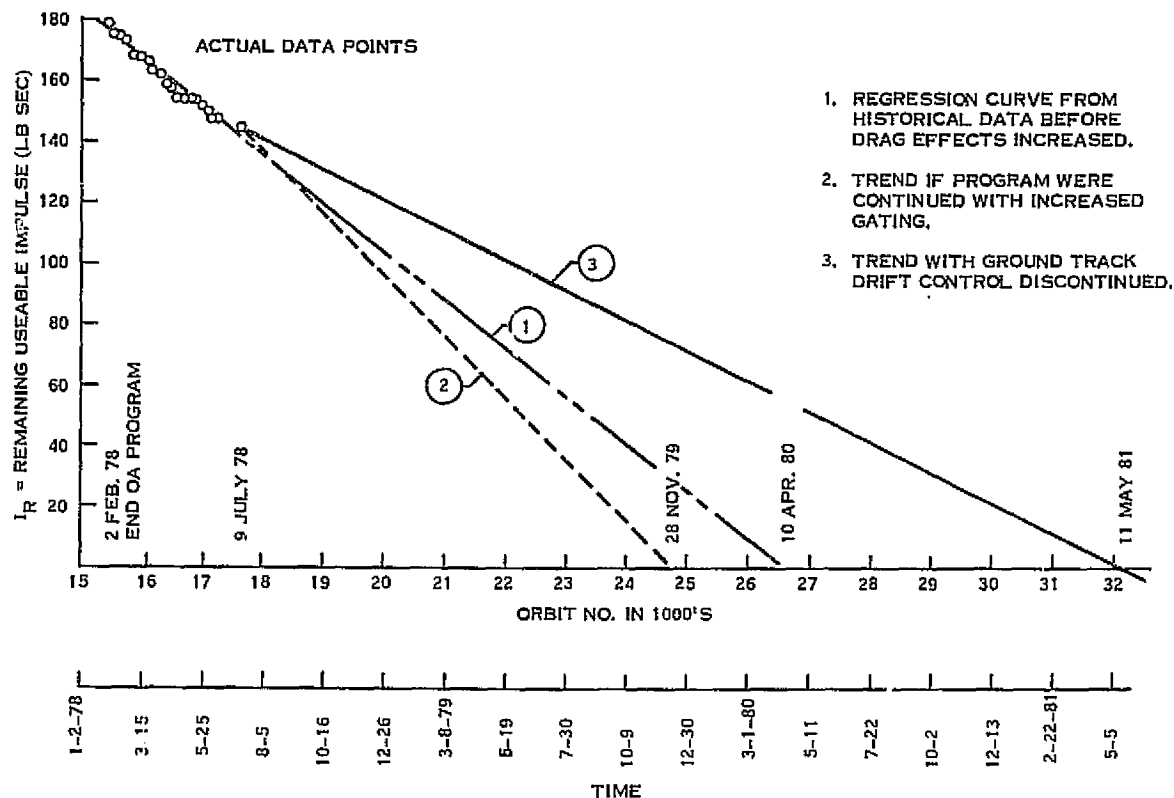


Figure 4-1. Landsat-2 Remaining Freon Life Projections Based on Historical Data

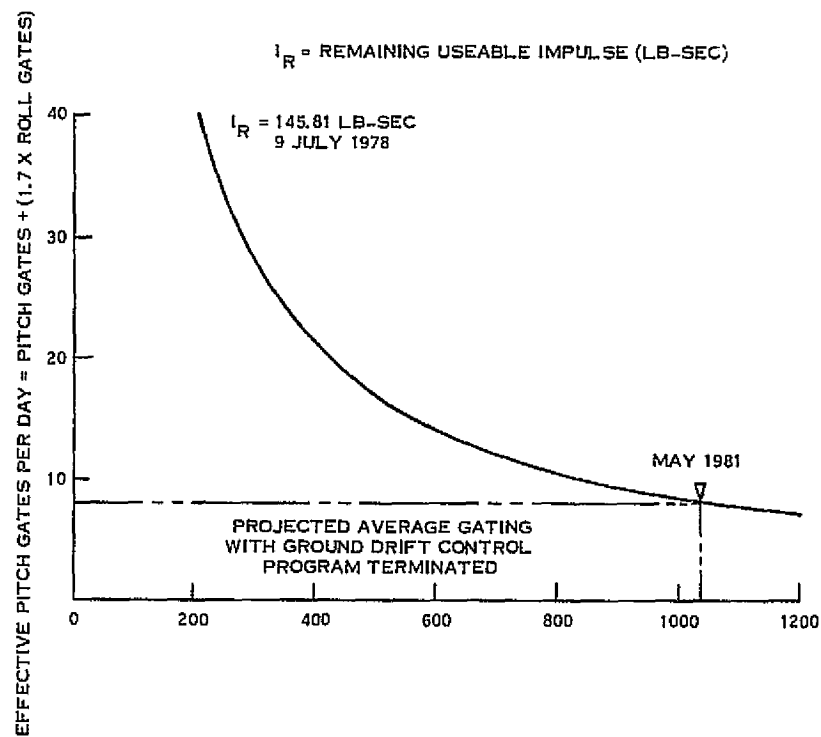


Figure 4-2. Landsat 2 Remaining Freon Life in Days - Ref. 9 July 1978

Table 4-1. Landsat-2 Pitch Position Bias Quarterly Pneumatic Gating Summary

Period		PPB Implementation Sequence			Minutes Positioned About Satellite Midnight, T_o		Resulting Average Number of Pitch Gates Per Day
From Orbit	To Orbit	* N_o	$N_o + 1$	$N_o + 2$	From	To	
16570 23 Apr 78	16759 8 May 78	+2.0	0.0	+2.0	$T_o - 24$	$T_o + 24$	2 to 3 (+P)
16760 8 May 78	16871 16 May 78	+2.0	+2.0	+2.0	$T_o - 22$	$T_o + 22$	0
16872 16 May 78	16900 18 May 78	+2.9	+2.9	+2.9	$T_o - 18$	$T_o + 14$	0
16901 18 May 78	16957 22 May 78	+2.9	+2.9	+2.9	$T_o - 24$	$T_o + 24$	5 to 6 (-P)
16958 22 May 78	17014 26 May 78	+2.9	+2.9	+2.9	$T_o - 24$	$T_o + 16$	2 to 3 (-P)
17015 26 May 78	17501 30 Jun 78	+2.9	+2.9	+2.9	$T_o - 25$	$T_o + 25$	5 to 7 (-P)
17502 30 Jun 78	17670 12 Jul 78	+2.9	+2.9	+2.9	$T_o - 29$	$T_o + 25$	8 to 10 (-P)
17671 12 Jul 78	17737 17 Jul 78	+2.9	+2.9	+2.9	$T_o - 25$	$T_o + 5$	0 to 1 (+P)
17738 17 Jul 78	17824 23 Jul 78	+2.9	+2.9	+2.9	$T_o - 28$	$T_o + 7$	0 to 1 (-P)

* N_o Equals Satellite Night

Table 4-2. Landsat-2 Subsystem Temperature and Pressure Averages

Func	Name	Units	Orbits						
			29	5102	10191	15211	16861	17300	17711
1084	RMP 1 Gyro Temperature	DGC	19.33 ⁽¹⁾	22.69	22.70	20.21 ⁽³⁾	24.39	24.25	23.32
1094	RMP 2 Gyro Temperature	DGC	70.00	74.26	74.50	65.14	64.77	64.59	64.30
1222	SAD RT MTR HSNG Temp.	DGC	19.50	22.98	22.73	20.08	25.32	25.34	24.41
1242	SAD LT MTR HSNG Temp.	DGC	26.87	29.79	30.26	28.17	31.01	30.67	30.19
1223	SAD RT MTR WNDNG Temp.	DGC	21.76	24.36	23.72	20.87	26.77	26.82	25.90
1243	SAD LT MTR WNDNG Temp.	DGC	30.23	32.83	33.15	30.47	33.81	33.40	32.90
1228	SAD RT HSG Pressure	PSI	7.26	7.18	7.00	6.77	6.77	6.77	6.77
1248	SAD LT HSG Pressure	PSI	7.28	7.21	6.91	6.46	6.48	6.48	6.48
1007	FWD Scanner MTR Temp.	DGC	22.07	23.80	23.97	21.18	25.14	24.86	24.09
1016	Rear Scanner MTR Temp.	DGC	24.19	25.04	24.83	22.87	25.96	25.63	25.14
1003	FWD Scanner Pressure	PSI	9.59 ⁽²⁾	D	D	D	D	D	D
1012	Rear Scanner Pressure	PSI	6.21	5.62	5.11	4.47	4.49	4.42	4.42
1212	Gas Tank Pressure	PSI	1948.00	1517.04	1256.98	863.19 ⁽⁴⁾	739.88	707.53	701.50
1210	Gas Tank Temperature	DGC	20.66	24.25	24.43	22.25	25.65	25.33	24.66
1213	Manifold Pressure	PSI	53.98	54.56	55.26	56.49	56.69	56.71	56.88
1211	Manifold Temperature	DGC	19.18	22.59	22.78	20.51	23.95	23.70	22.98
1059	CLB Power Supply Card Temp	DGC	39.00	41.47	41.81	39.93	42.47	42.38	41.91
1260	TH01 EBP	DGC	24.29	27.21	27.58	25.58	28.43	28.03	27.55
1261	TH02 EBP	DGC	20.29	23.25	23.48	21.32	24.75	24.43	23.77
1262	TH03 EBP	DGC	18.28	21.46	21.29	18.99	23.12	22.99	22.26
1263	TH01 STS	DGC	6.54	0.52	- 1.66	- 3.67	0.59	- 0.63	- 1.07
1264	TH02 STS	DGC	D	D	D	D	D	D	D
1265	TH03 STS	DGC	8.46	8.67	11.66	9.78	10.68	9.15	8.07
1266	TH04 STS	DGC	- 2.78	- 3.26	- 0.08	- 3.56	0.88	0.61	- 2.37
1267	TH05 STS	DGC	9.62	5.57	4.24	0.97	5.86	3.98	3.27
1224	SAD R FSST	DGC	35.00	35.81	34.24	7.91 ⁽⁵⁾	46.25	45.21	44.44
1244	SAD L FSST	DGC	50.00	49.13	55.24	52.49	55.52	54.31	54.37

(1) RMP-1 Left off after initial test in Orbit 1

(2) Prelaunch leak - refer to text

(3) RMP1 in standby mode during orbit adjust maneuvers

(4) Pressure drop due to freon consumed during orbit adjust maneuvers

(5) Low temperature caused by large beta angle shadowing

D Defective telemetry point

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Table 4-3. Landsat-2 ACS Voltages and Currents

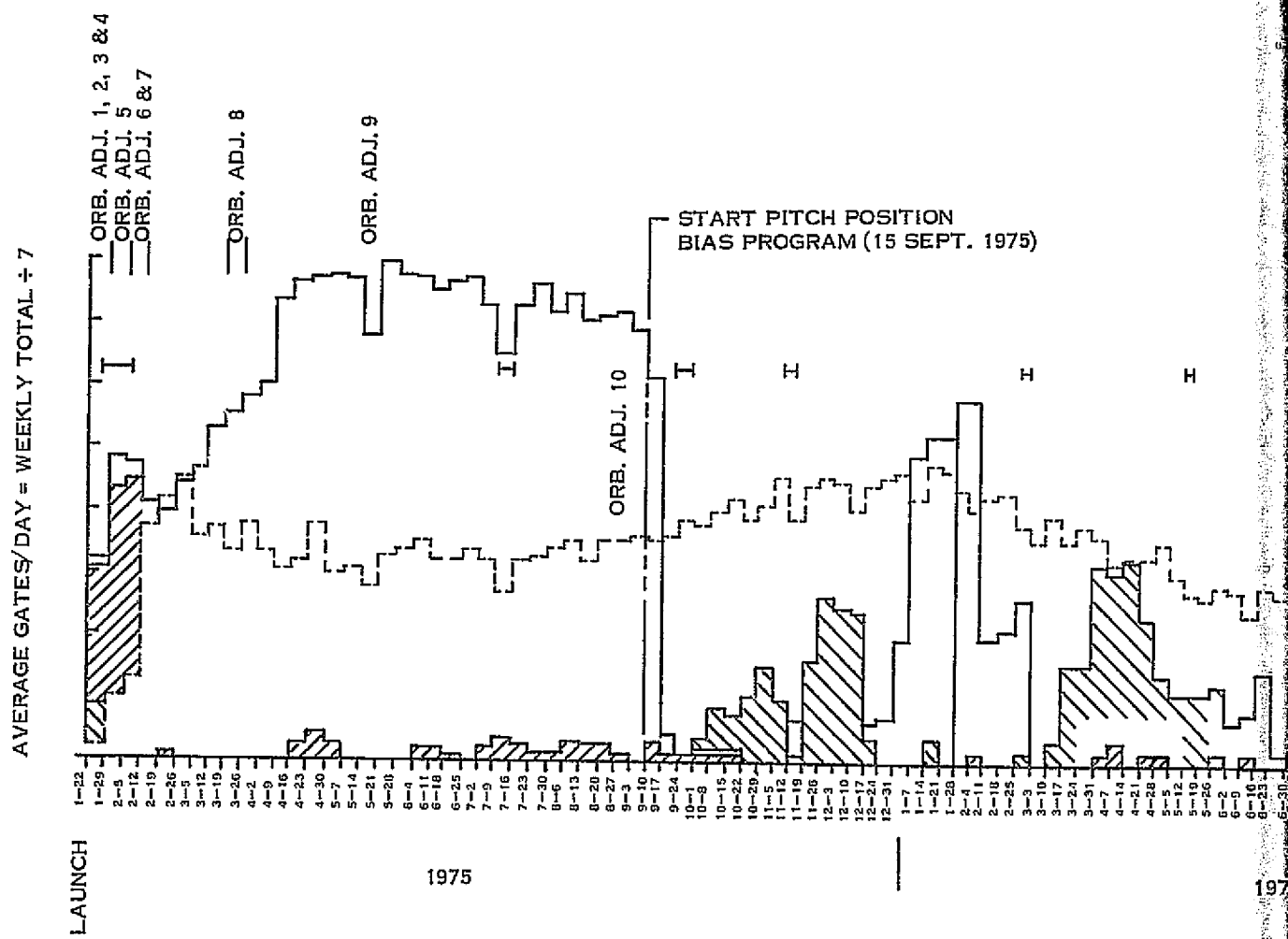
Func	Name	Units	Orbit						
			29	5102	10191	15211	16861	17300	17711
1081	RMP 1 MTR Volts	VDC	F	F	F	F	F	F	F
1082	RMP 1 MTR Current	Amps	F	F	F	F	F	F	F
1080	RMP 1 Supply Volts	VDC	F	F	F	F	F	F	F
1091	RMP 2 MTR Volts	VDC	29.99	29.92	29.87	29.90	29.88	29.88	29.89
1092	RMP 2 MTR Current	Amps	0.10	0.10	0.10	0.10	0.10	0.10	0.10
1090	RMP 2 Supply Volts	VDC	-23.63	-23.59	-23.55	-23.61	-23.58	-23.58	-23.59
1220	SAD RT MTR WNDNG Volts	VDC	- 5.47	- 4.47	- 4.09	- 4.25	- 4.10	- 4.04	- 4.17
1240	SAD LT MTR WNDNG Volts	VDC	- 5.08	- 4.72	- 4.57	- 4.63	- 4.71	- 4.64	- 4.66
1227	SAD RT -15 VDC Conv	VDC	15.14	15.16	15.15	15.18	15.12	15.12	15.12
1247	SAD LT -15 VDC Conv	VDC	15.23	15.21	15.22	15.21	15.21	15.21	15.20
1056	CLB \pm 6 VDC	TMV	2.35	2.38	2.40	2.40	2.40	2.40	2.40
1055	CLB \pm 10 VDC	TMV	2.88	2.92	2.94	2.94	2.94	2.94	2.94
1057	CLB Power Supply Volts	TMV	2.97	2.96	2.97	2.96	2.97	2.97	2.97

Table 4-4. Landsat-2 ACS Attitude Errors and Driver Duty Cycles

Func	Name	Units	Orbit						
			26	5102	10191	15211	16861	17300	17711
1041	Pitch Fine Error	DEG	-0.16	-0.13	-0.62	-0.78	-1.10	-1.13	-1.12
1043	Pitch Flywheel Speed	RPM	-156.12	-162.97	3.39	51.87	43.55	180.78	-146.47
1038	Pitch Mtr Drvr CCW	PCT	6.64	6.05	4.33	1.76	4.12	5.12	8.59
1039	Pitch Mtr Drvr CW	PCT	2.03	1.80	3.87	4.59	6.39	8.80	5.79
1030	Roll Fine Error	DEG	-0.13	-0.14	-0.21	-0.20	-1.14	-1.15	-1.12
1027	Roll Rear Flywheel SPD	RPM	729.30	748.56	792.27	796.70	742.58	783.21	752.71
1026	Roll Fwd Flywheel SPD	RPM	703.02	735.81	737.44	767.93	721.80	743.55	748.23
1022	Roll Rear Mtr Drvr CCW	PCT	0.67	0.63	0.87	0.01	.60	.40	.71
1025	Roll Rear Mtr Drvr CW	PCT	7.54	6.34	6.09	6.07	5.39	5.57	5.72
1023	Roll Fwd Mtr Drvr CCW	PCT	0.70	0.87	0.72	0.03	.74	.77	.94
1024	Roll Fwd Mtr Drvr CW	PCT	5.46	4.01	4.34	3.20	3.57	4.31	3.84
1035	Yaw Tach	RPM	-95.73	-38.16	-163.04	-34.38	-96.96	-39.72	-159.65
1033	Yaw Mtr Drvr CW	PCT	1.88	2.01	1.91	1.81	1.71	2.05	1.92
1034	Yaw Mtr Drvr CCW	PCT	2.10	1.90	2.49	1.50	1.79	1.69	2.46
1221	SAD Right Tach	D/M	3.38	3.38	3.37	3.42	3.37	3.34	3.35
1241	SAD Left Tach	D/M	3.68	3.55	3.48	3.55	3.52	3.52	3.52

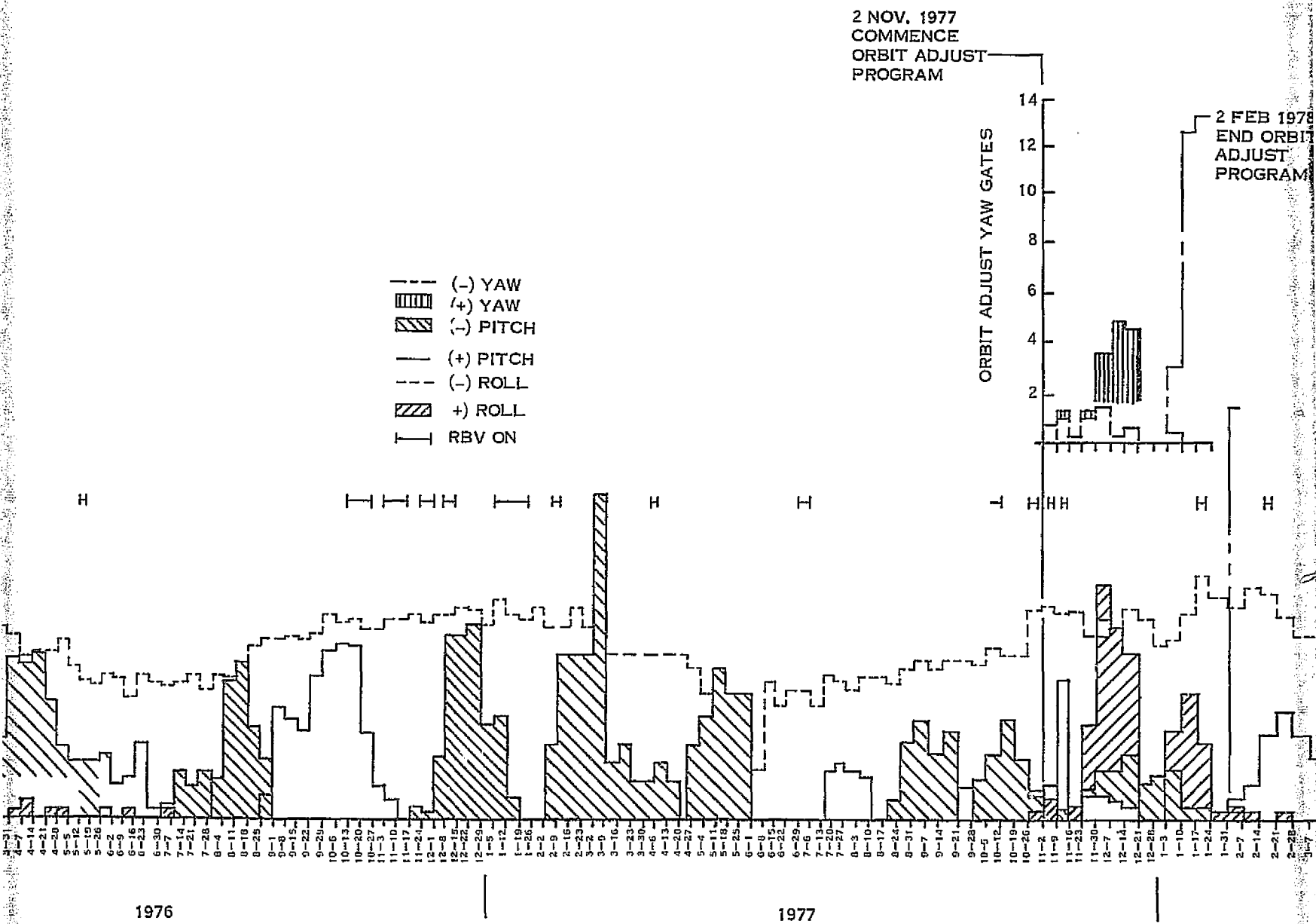
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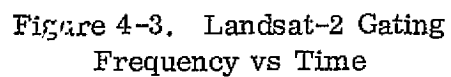


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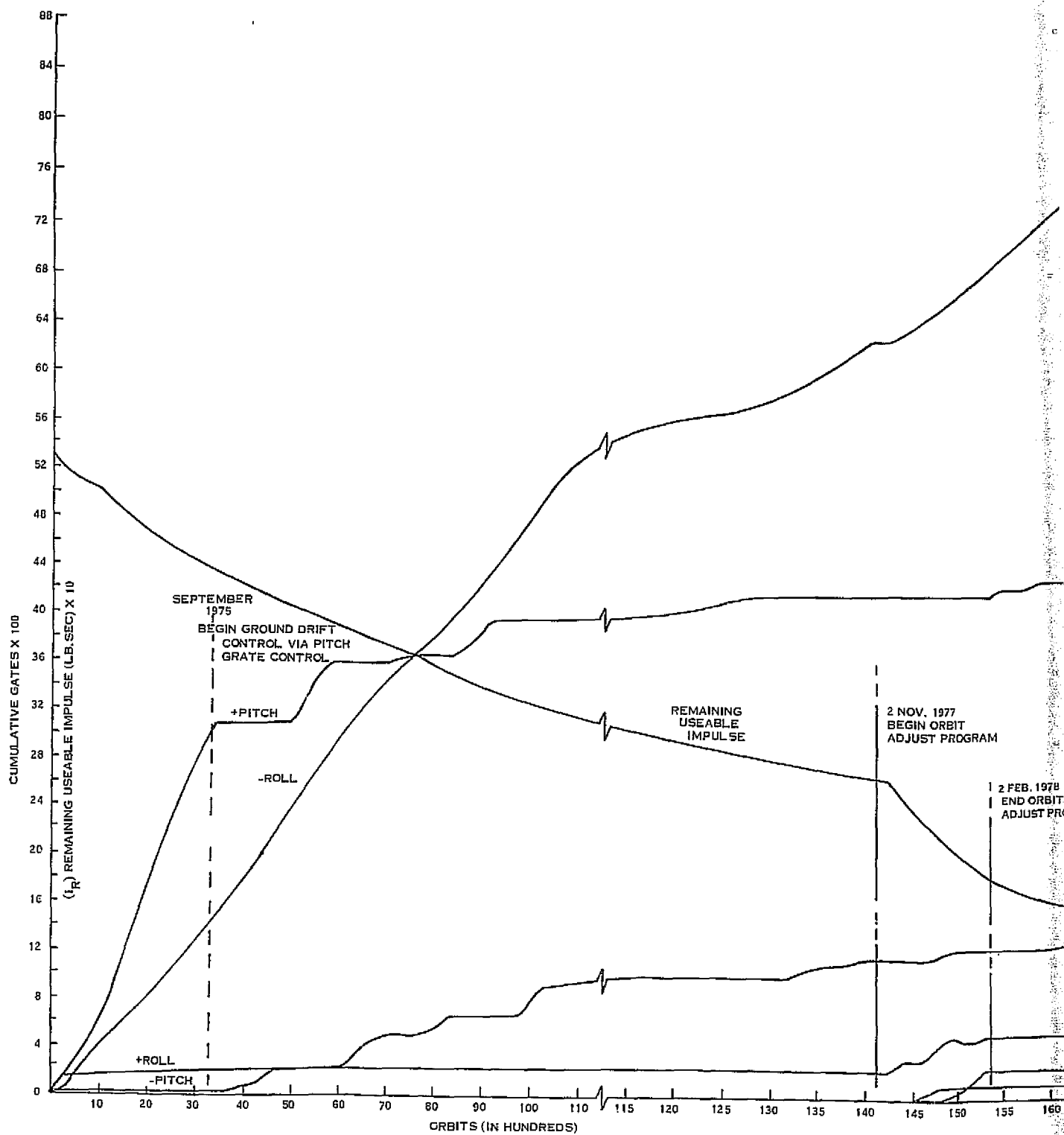


Figure 4-4.

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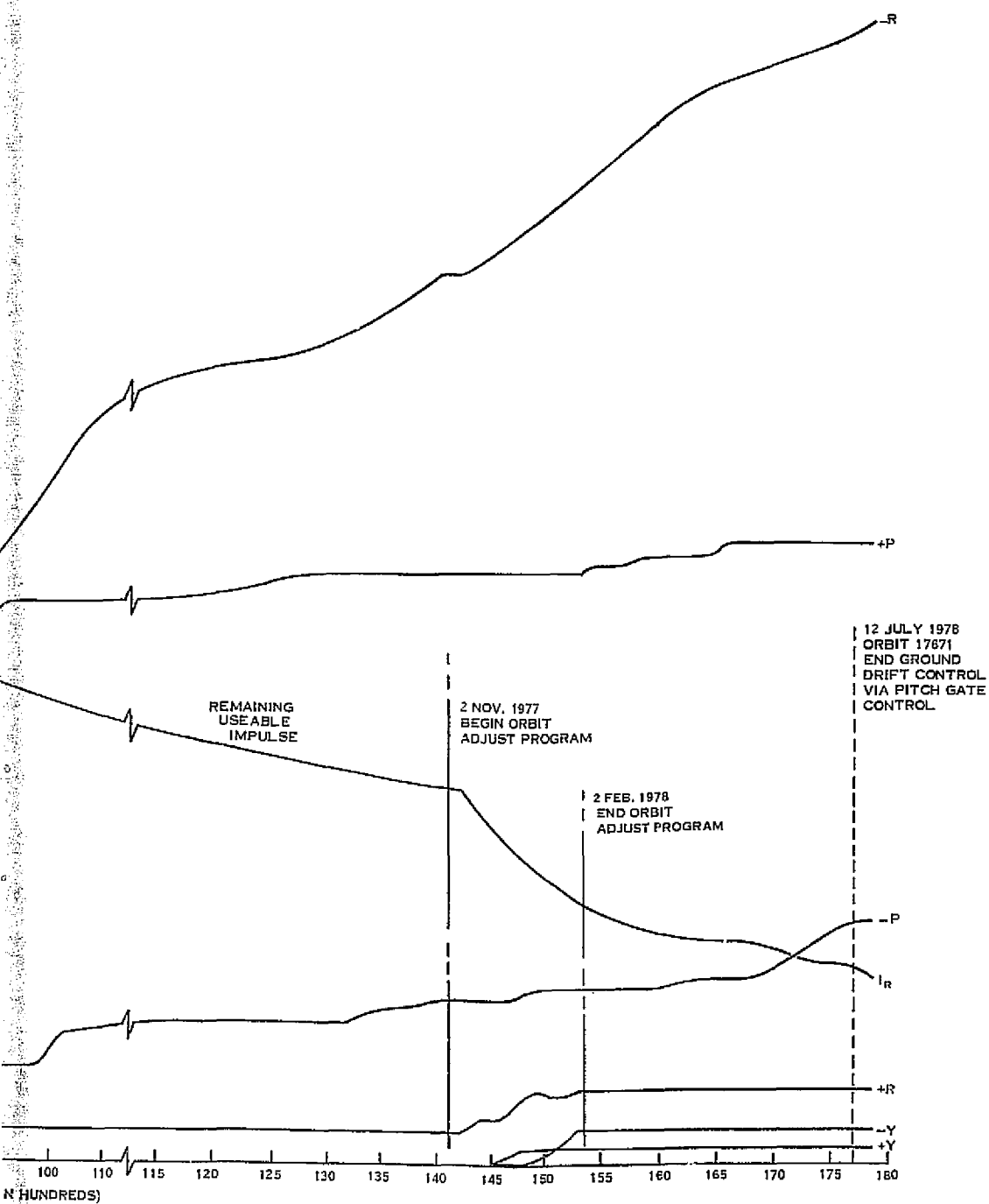


Figure 4-4. Landsat-2 Gating History

SECTION 5
COMMAND/CLOCK SUBSYSTEM (CMD)
LANDSAT-2

SECTION 5 COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally in this report period. During Orbit 17375 the S/C clock was set back two seconds. Figure 5-1 shows the history of the S/C clock drift since launch. Figure 5-2 shows the cumulative clock drift, 19.219 seconds faster in 42 months; and Figure 5-3 gives drift rate of S/C clock. The clock of Landsat-2 drifts in opposite direction from the clock of Landsat-1 and in the same direction as Landsat 3.

Table 5-1 shows typical telemetry values since launch. All are nominal.

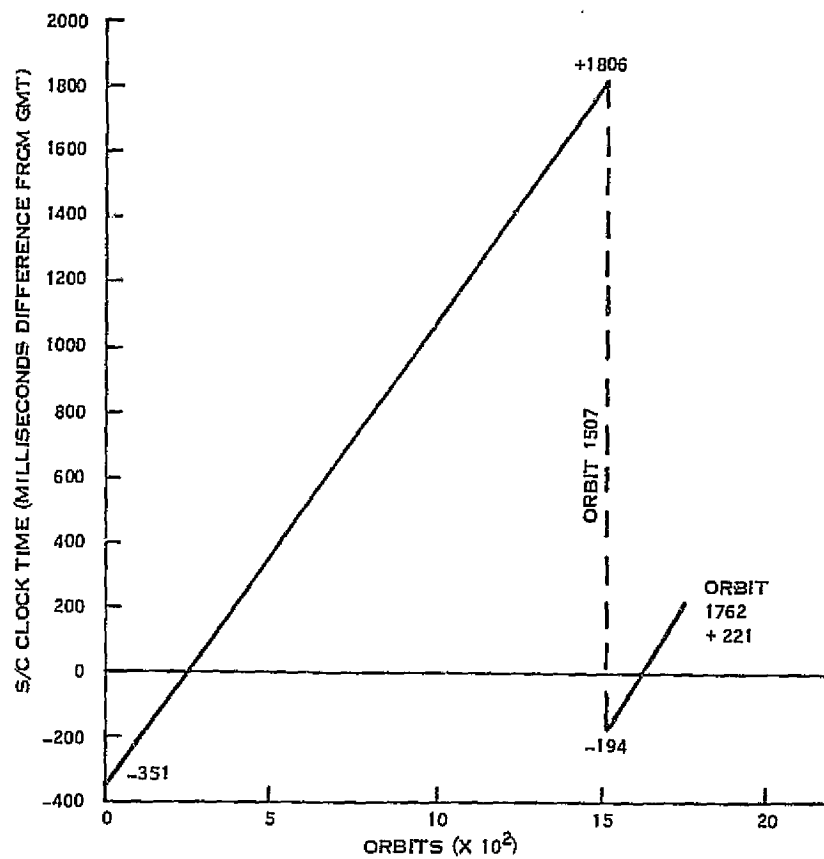


Figure 5-1. Landsat-2 Drift History



Figure 5-2. Cumulative Clock Drift

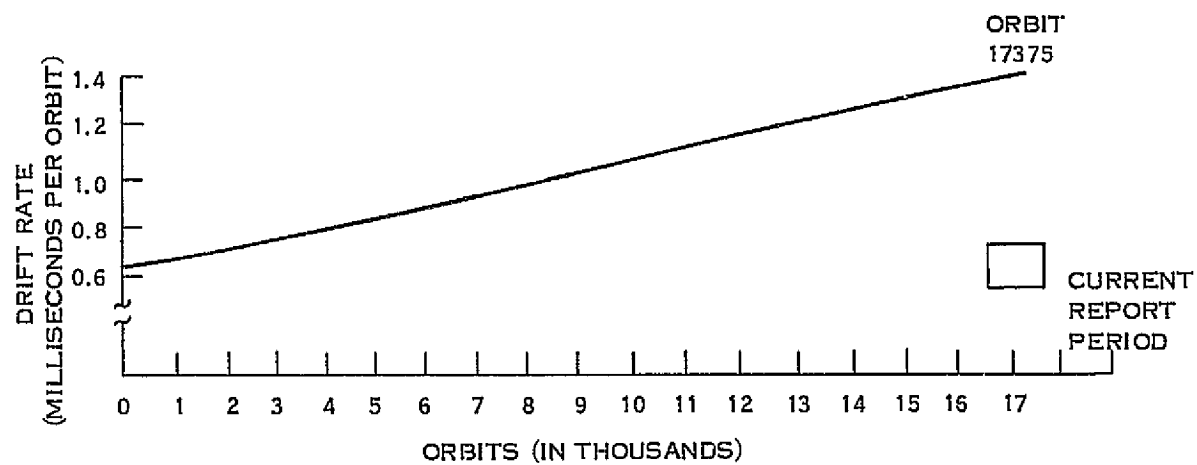


Figure 5-3. Drift Rate of S/C Clock

Table 5-1. Command/Clock Telemetry Summary, Landsat-2

Function No.	Name	Orbit							
		Units	35	5091	10192	15211	16861	17300	17710
8005	Pri. Power Supply Temp	DGC	38.82	39.43	39.08	39.12	39.14	39.20	39.16
8006	Ped. Power Supply Temp	DGC	36.93	38.00	37.85	37.91	38.08	38.11	38.04
8007	Pri. Osc. Temp	DGC	28.70	28.70	28.56	28.69	27.87	27.87	28.16
8008	Red Osc. Temp	DGC	27.82	27.26	26.97	27.40	28.95	26.95	26.95
8009	Pri. Osc. Output	TMV	1.06	1.05	1.05	1.06	1.05	1.05	1.06
8010	Red. Osc. Output	TMV	1.17	1.18	1.18	1.18	1.18	1.18	1.13
8011	100 KHz	TMV	3.17	3.15	3.15	3.15	3.15	3.15	3.16
8012	10 KHz	TMV	3.08	3.05	3.05	3.05	3.05	3.05	3.05
8013	2.5 KHz	TMV	3.01	2.95	2.95	2.95	2.95	2.95	2.95
8014	400 Hz	TMV	4.17	4.45	4.45	4.45	4.45	4.45	4.45
8015	Pri. +4V Power Supply	N		2.05	2.05	2.05	2.05	2.05	2.05
8016	Red. +4V Power Supply	TMV	N	2.00	2.00	2.00	2.00	2.00	2.01
8017	Pri. +6V Power Supply	TMV	N	2.30	2.30	2.30	2.30	2.30	2.31
8018	Red. +6V Power Supply	TMV	N	2.30	2.30	2.30	2.30	2.30	2.31
8019	Pri. -6V Power Supply	TMV	N	5.23	5.23	5.23	5.23	5.23	5.23
8020	Red. -6V Power Supply	TMV	N	5.23	5.23	5.23	5.23	5.23	5.23
8021	Pri. -23V Power Supply	TMV	N	5.70	5.70	5.70	5.70	5.70	5.69
8022	Red -23V Power Supply	TMV	N	5.65	5.65	5.65	5.65	5.65	5.66
8023	Pri. -29V Power Supply	TMV	N	5.29	5.29	5.30	5.30	5.30	5.30
8024	Red -29V Power Supply	TMV	N	5.29	5.28	5.29	5.29	5.29	5.29
8101	CIU A - 12V	TMV	3.79	3.97	3.97	3.97	3.96	3.96	3.96
8102	CIU B - 12V	TMV	3.78	3.95	3.95	3.95	3.95	3.95	3.95
8103	CIU A - 5V	TMV	3.93	4.15	4.15	4.14	4.13	4.13	4.14
8104	CIU B - 5V	TMV	3.90	4.10	4.10	4.10	4.10	4.10	4.10
8105	CIU A Temp	DGC	26.01	21.67	21.67	22.29	20.81	20.88	21.01
8106	CIU B Temp	DGC	23.35	19.70	19.71	20.21	19.00	19.04	19.16
8201	Receiver RF-A Temp	DGC	N	29.14	28.83	28.86	28.38	28.36	28.48
8202	Receiver RF-B Temp	DGC	29.09	F	22.66	22.67	22.06	22.03	22.18
8203	D MOD A Temp	DGC	28.95	38.56	38.25	38.33	37.83	37.85	38.09
8204	D MOD B Temp	DGC	37.73	26.72	26.31	26.34	25.74	25.74	25.90
8205	Receiver A AGC	DBM	F	-91.43	-90.78	-89.02	-93.10	-88.96	-87.21
8206	Receiver B AGC	DBM	-87.83	F	F	F	F	F	F
8207	Amp. A Output	TMV	F	2.54	2.75	2.66	2.34	2.59	2.69
8208	Amp. B Output	TMV	2.10	F	F	F	F	F	F
8209	Freq. Shift Key A Out	TMV	F	1.08	1.09	1.08	1.08	1.08	1.08
8210	Freq. Shift Key B Out	TMV	1.11	F	F	F	F	F	F
8211	Amp. A Output	TMV	F	1.13	1.14	1.13	1.13	1.13	1.13
8212	Amp. B Output	TMV	1.13	F	F	F	F	F	F
8215	D MOD A - 15V	TMV	F	4.87	4.87	4.87	4.87	4.87	4.87
8216	D MOD B - 15V	TMV	4.77	F	F	F	F	F	F
8217	Regulator A - 10V	TMV	F	5.40	5.40	5.40	5.40	5.40	5.40
8218	Regulator B - 10V	TMV	5.32	F	F	F	F	F	F
8311	ECAM Mem. Tmp	DGC	N	18.41	18.41	18.38	17.90	18.01	18.13
8312	ECAM Pwr Sply Temp	DGC	N	23.13	23.00	22.97	22.11	22.25	22.52

N - Data Not Available.
F - Unit Off.

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SECTION 6
TELEMETRY SUBSYSTEM (TLM)
LANDSAT-2

SECTION 6
TELEMETRY SUBSYSTEM (TLM)

The TLM has operated nominally in this report period.

Table 6-1 shows typical telemetry values since launch. All are nominal. Functions 1264 (Thermal Shield 5 Temperature), 4002 (MMCA Board 2 Temperature) and 13200 (APU 24 Volt Input) were defective before launch but verification of these functions is acceptable by adjacent temperature and downstream voltage measurements respectively.

The memory section of the telemetry matrix remains in the 0.0 mode.

Table 6-1. Landsat-2 T&P Telemetry Values

Func	Name	Units	Orbit						
			35	5091	10192	15211	16861	17300	17710
9001	Memory Sequencer A Converter	VDC	4.45	4.45	4.45	4.45	4.45	4.45	4.45
9002	Memory Sequencer B Converter	VDC	F	F	F	F	F	F	F
9003	Memory Sequencer Temp	DGC	20.00	21.37	21.34	21.87	19.12	19.37	20.51
9004	Formatter A Converter	VDC	4.52	4.52	4.52	4.54	4.50	4.50	4.50
9005	Formatter B Converter	VDC	F	F	F	F	F	F	F
9006	Dig. Mux A Converter	VDC	4.22	4.22	4.22	4.23	4.20	4.21	4.21
9007	Dig. Mux B Converter	VDC	F	F	F	F	F	F	F
9008	Formatter/Dig Mux Temp	DGC	25.00	27.80	29.75	32.56	23.75	24.01	23.91
9009	Analog Mux A Converter	VDC	4.02	4.05	4.05	4.05	4.05	4.05	4.05
9010	Analog Mux B Converter	VDC	F	F	F	F	F	F	F
9011	A/D Converter A Voltage	VDC	4.02	4.03	4.04	4.05	4.03	4.03	4.03
9012	A/D Converter B Voltage	VDC	F	F	F	F	F	F	F
9013	Analog Mux, A/D Conv. Temp	DGC	25.00	27.33	27.44	29.72	24.75	24.69	24.91
9014	Preregulator A Voltage	VDC	4.00	4.00	4.00	4.00	4.00	4.00	4.00
9015	Preregulator B Voltage	VDC	F	F	F	F	F	F	F
9016	Reprogrammer Temp	DGC	22.50	24.74	25.47	28.98	21.60	21.60	21.84
9017	Memory A Converter	VDC	4.45	4.45	4.45	4.45	4.45	4.45	4.45
9018	Memory A Temp	DGC	17.50	17.17	17.16	16.66	14.76	14.40	15.30
9019	Memory B Converter	VDC	F	F	F	F	F	F	F
9020	Memory B Temp	DGC	17.50	17.41	17.50	17.52	15.34	16.05	16.86
9100	Reflected Power	dBm	18.29	14.18	14.53	15.24	14.02	13.99	13.89
9101	Xmtr A-20 VDC	VDC	3.80	3.97	3.98	3.98	3.97	3.97	3.97
9102	Xmtr B-20 VDC	VDC	F	F	F	F	F	F	F
9103	Xmtr A Temp	DGC	27.73	26.40	30.37	26.69	21.44	21.12	21.56
9104	Xmtr B Temp	DGC	N	27.74	31.74	37.80	22.52	22.18	22.69
9105	Xmtr A Power Output	dBm	27.73	26.69	26.41	26.59	26.29	26.28	26.30
9106	Xmtr B Power Output	dBm	F	F	F	F	F	F	F

N - Data Not Available.

F - Unit Off.

SECTION 7
ORBIT ADJUST SUBSYSTEM (OAS)
LANDSAT-2

SECTION 7
ORBIT ADJUST SUBSYSTEM (OAS)

No orbit adjust maneuvers were conducted during this report period.

Table 7-1 summarizes all of the OAS system's operations since launch.

Table 7-2 shows typical telemetry values for the OAS during quiescent periods. Variations in thrust chamber temperatures shown in Table 7-2 are consistent with variations in sun intensity and sun angle.

Table 7-1. Landsat-2 Orbit Adjust Summary

Orbit Adjust No.	Orbit No.	Epoch (Burn Start Time)	Burn Axis		Burn Duration (Seconds)		Post Burn Freon Status (PSIA)	Hydrazine Consumed (Lbs)	Post Burn Hydrazine Tank P. (PSIA)	Burn Efficiency (%)	Δa (Meters)	Δi (Degrees)
			(-Y)	(+X)	(-Y)	(+X)						
1	32	21 Jan 75 00:34:00.8		-X		4.8	1947.19	0.02	539.96	104.3	39	0.0
2	71	27 Jan 75 19:57:00.8		+X		4.8	1923.78	0.02	547.46	90.1	-36	0.0
3	79	28 Jan 75 09:49:00.8		-X		420.0	1919.50	1.62	547.46	107.0	3455	0.0
4	86	28 Jan 75 21:13:00.8		-X		420.0	1916.40	1.51	502.46	107.0	3233	0.0
5	163	3 Feb 75 10:36:00.8		+X		420.0	1884.35	1.42	468.75	97.0	-2974	0.0
6	191	5 Feb 75 10:15:00.8		+X		360.0	1874.51	1.15	438.71	97.5	-2421	0.0
7	212	6 Feb 75 22:31:00.8		+X		308.8	1865.15	0.95	416.21	98.6	-2009	0.0
8	880	26 Mar 75 21:44:00.8		-X		12.8	1837.05	0.04	397.47	107.6	82	0.0
9	1632	19 May 75 18:54:00.8		-X		24.0	1757.46	0.07	401.21	107.6	154	0.0
10	2958	22 Aug 75 22:11:58.8		-X		22.0	1640.00	0.07	404.96	110.3	146	0.0
11	14157	2 Nov 77 23:47:01.2	-Y		5.2		1085.19	0.02	425.22	*	2.1	0.0
12	14171	3 Nov 77 23:47:07.2	-Y		60.0		1097.50	0.18	419.94	125.2	23.8	0.002
13	14185	4 Nov 77 23:52:49.2	-Y		60.0		1085.19	0.16	417.14	130.7	28.7	0.002
14	14324	14 Nov 77 23:07:01.2 23:11:42.4	-Y	+X	300.0	18.8	1065.50	0.97	401.19	97.1	128.4	0.007
15	14352	16 Nov 77 23:18:01.2 23:22:42.4	-Y	+X	300.0	18.8	1047.79	0.82	388.54	115.8	104.6	0.009
16	14382	19 Nov 77 02:06:01.2		+X		59.0	1048.00	0.18	385.80	100.9	-311.9	0.0
17	14514	28 Nov 77 14:08:01.2	-Y		300.0		1035.87	0.87	373.95	99.6	197.3	0.007
18	14542	30 Nov 77 14:17:01.2 14:22:41.2	-Y	+X	420.0	80.0	1025.30	1.43	356.13	105.8	-208.0	0.010
19	14570	2 Dec 77 14:27:31.2 14:36:11.2	-Y	+X	600.0	80.0	999.87	1.74	336.17	103.0	-131.0	0.014
20	14617	5 Dec 77 08:00:01.2	-Y		800.0		999.87	1.74	336.17	103.0	-131.0	0.014

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		23:28:01.2	-Y		600.8		877.81	0.70	215.55	101.9	109.4	0.009
33	15155	13 Jan 78 13:18:01.2 13:27:48.0	-Y	+X	600.8	14.0	863.19	1.31	209.91	99.5	43.5	0.009
34	15197	16 Jan 78 13:35:01.2 13:44:42.0	-Y	+X	600.8	20.0	863.19	1.11	205.20	98.5	15.9	0.008
35	15211	17 Jan 78 13:41:01.2 13:50:56.0	-Y	+X	601.8	7.0	854.24	0.71	202.49	96.2	61.5	0.008
36	15225	18 Jan 78 13:46:01.2 13:55:26.0	-Y	+X	600.8	36.0	838.57	1.27	197.50	94.8	-43.0	0.008
37	15295	23 Jan 78 14:15:01.2 14:24:46.0	-Y	+X	600.8	16.0	835.90	0.91	194.14	99.8	27.7	0.008
38	15309	24 Jan 78 14:21:01.2 14:36:46.0	-Y	+X	600.8	16.0	814.93	1.05	191.03	84.2	21.7	0.007
39	15314	24 Jan 78 22:57:00.0 23:06:50.0	-Y	+X	600.0	10.0	814.13	1.02	187.50	92.2	45.0	0.007
40	15323	25 Jan 78 14:27:01.2 14:36:46.0	-Y	+X	600.8	16.0	811.82	1.02	186.48	90.6	- 4.6	0.007
41	15328	25 Jan 78 23:03:31.2 23:12:02.0	-Y	+X	600.8	30.0	806.81	1.03	182.05	88.8	- 32.8	0.007
42	15337	26 Jan 78 14:32:01.2 14:51:42.0	-Y	+X	600.8	20.0	807.40	0.99	179.25	90.5	14.7	0.007
43	15398	30 Jan 78 23:31:54.2 23:42:12.0	-Y	+X	637.8	20.0	801.57	1.04	176.34	95.3	- 1.9	0.007
44	15412	31 Jan 78 23:38:01.2 23:47:42.0	-Y	+X	600.8	20.0	801.60	0.97	174.20	82.9	- 5.4	0.006
45	15426	1 Feb 78 23:44:01.2 23:53:46.0	-Y	+X	600.8	16.0	801.57	0.95	172.50	88.0	4.5	0.006
46	15440	2 Feb 78 23:50:01.2	-Y		600.8		801.57	0.92	171.78	100.5	54.5	0.006

* - Burn too short to influence tracking data.

Table 7-2. Landsat-2 OAS Telemetry Values

Func.	Name	Units	Orbit						
			50	5102	10191	15211	16861	17300	17711
2001	Prop. Tank Temp.	DGC	23.03	23.89	23.05	24.48	20.88	20.97	21.39
2003	Thrust Chamber No. 1 (-X) Temp.*	DGC	24.84	25.12	21.75	20.83	28.22	28.68	28.51
2004	Thrust Chamber No. 2 (+X) Temp.*	DGC	37.34	38.55	37.60	35.32	38.13	37.93	35.16
2005	Thrust Chamber No. 3 (-Y) Temp.*	DGC	47.22	46.35	49.78	78.50 ⁺	38.46	36.17	37.45
2006	Line Pressure	PSIA	545.60	413.25	419.94	205.21	168.89	169.84	170.62

* Orbit adjust heaters were ON.

SECTION 8
MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)
LANDSAT-2

SECTION 8
MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

The spacecraft was corrected for unbalanced magnetic moments in Orbits 293 and 321 as reported earlier. These adjustments were made on the pitch magnetic rod of the MMCA.

No adjustment to the MMCA dipoles was made during this report period.

Orbital averages of MMCA telemetry functions for selected orbits are given in Table 8-1.

Table 8-1. Landsat-2 MMCA Telemetry Values

Function	Name	Units	Orbit						
			50	5102	10191	15211	16861	17300	17741
4001	A1 Board Temp	°C	20.56	19.47	19.12	18.82	18.39	18.32	18.60
4002	A2 Board Temp	°C	D	D	D	D	D	D	D
4003	Hall Current	TMV	3.40	3.40	3.40	3.40	3.40	3.40	3.40
4004	Yaw Flux Density	TMV	3.05	3.07	3.07	3.07	3.07	3.07	3.07
4005	Pitch Flux Density	TMV	3.15**	2.90	2.90	2.90	2.90	2.89	2.90
4006	Roll Flux Density	TMV	2.99	2.97	2.97	2.97	2.97	2.97	2.96

D = Defective Telemetry Function (Pre-launch)

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

LANDSAT-2

SECTION 9
UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

The USB Subsystem has operated nominally in this report period.

Table 9-1 shows telemetry values since launch. All are nominal. The transmitter has maintained a steady indicated power output of greater than 1.3 watts since launch. Figure 9-1 shows AGC readings of Goldstone for the same two points in space. The scatter of data points reflect variations in the ground station calibration and readout.

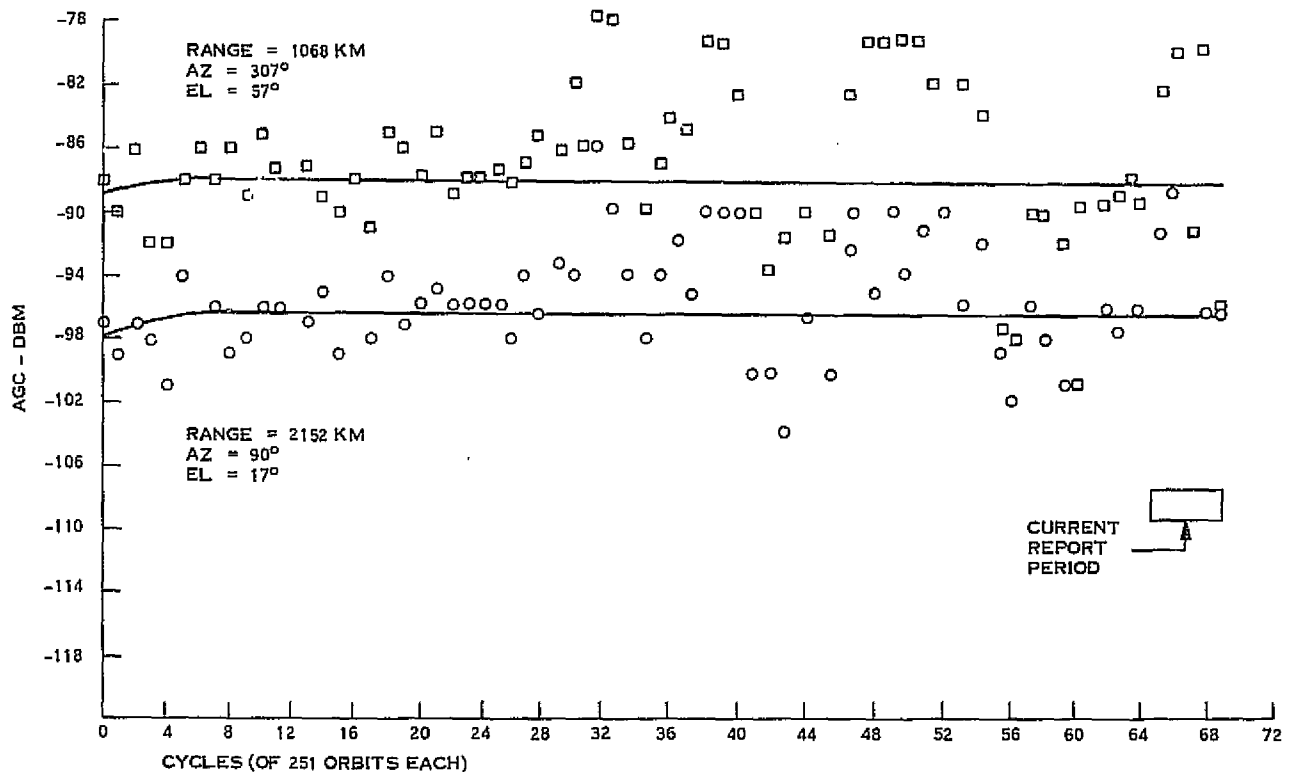


Figure 9-1. USB (Link 4) AGC Readings at Goldstone with 30' Antenna - Landsat-2

Table 9-1. Landsat-2 USB/PMP Telemetry Values

Func.	Name	Units	Orbits						
			15	5091	10641	15211	16802	17202	17712
11001	USB Rcvr AGC	dBm	-112.72	-124.29	-124.85	-126.13	-125.64	-131.50	-123.80
11002	USB Xmtr Pwr	W	1.36	1.38	1.39	1.39	1.37	1.35	- 1.35
11003	USB Rcvr Error	kHz	- 2.15	- 2.97	- 3.43	- 4.98	- 2.50	- 10.75	- 2.55
11004	USB Xpond Temp	DGC	25.88	27.49	29.06	33.03	24.45	25.29	24.57
11005	USB Xpond Press	PSI	17.08	16.49	15.96	16.03	15.28	15.15	15.20
11007	USB Xmtr A -15V	VDC	2.36	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	F	2.42	2.39	2.36	2.43	2.42	2.43
11009	USB Range -15V	VDC	2.07	2.06	2.06	2.06	2.05	2.05	2.05
11101	PMP Pwr A Volt	VDC	- 15.10	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	F	- 14.99	- 14.99	- 14.96	- 15.00	- 14.94	- 15.00
11103	PMP Temp A	DGC	37.30	34.67	37.49	43.12	28.54	28.42	28.79
11104	PMP Temp B	DGC	28.34	36.08	38.64	44.11	30.05	31.43	30.30

SECTION 10
ELECTRICAL INTERFACE SUBSYSTEM (EIS)
LANDSAT-2

SECTION 10

ELECTRICAL INTERFACE SUBSYSTEM (EIS) LANDSAT-2

The Auxiliary Processing Unit (APU) consisting of Search Track Data, Time Code Data, and Back-up Timers operated satisfactorily throughout this report period. Telemetry for the APU is shown in Table 10-1, and is nominal.

Table 10-1. Landsat-2 APU Telemetry Functions

Function	Description	Unit	Orbit					
			21	10192	15211	16862	17310	17711
13200	APU, -24.5 VDC	TMV	D	D	D	D	D	D
13201	APU, -12 Volts	TMV	2.42	2.45	2.45	2.42	2.45	2.45
13202	APU Temp	DGC	27.44	28.78	30.64	26.16	25.88	26.23

D - Defective Telemetry (Prelaunch)

The Power Switching Module (PSM) containing the switching relays for power to the OAS, MSS, WBPA-1, WBPA-2, WBVTR-1, WBVTR-2, RBV and PRM, functioned normally. During this report period, the MSS, WBPA-2 and WBVTR-2 power circuits, have been operated on a regular basis. RBV and WBPA-1 power circuits have been used for limited operation.

The Interface Switching Module performed all switchings normally during this report period.

SECTION 11
THERMAL SUBSYSTEM (THM)
LANDSAT-2

SECTION 11
THERMAL SUBSYSTEM (THM)

The Thermal Control Subsystem in Landsat-2 has provided satisfactory control of all spacecraft equipments since launch.

Table 11-1 gives average subsystem telemetry values for several representative orbits during the 42 months of operation on Landsat-2. Average temperatures of the sensory ring bays are plotted in Figure 11-1.

During this report period the sun intensity decreased from 0.989 to 0.969 times the mean annual value. The decrease in the sun angle to the spacecraft increased the night length. As a result, the average spacecraft temperature reached a minimum during this report period.

A history of compensation load switching since launch is shown in Table 11-2. All compensation loads remained off in this report period.

Table 11-1. Thermal Subsystem Analog Telemetry
(Average Value for Frames of Data Received in NBTR Playback)

Function No.	Function Description	Unit	Orbits						
			21	5102	10192	15211	16862	17310	17711
7001	THM TH01 STI	DGC	19.40	19.07	19.59	19.68	17.20	17.34	18.27
7002	THM TH02 SBO	DGC	17.18	17.47	17.65	17.36	16.50	16.46	17.15
7003	THM TH03 STI	DGC	18.73	18.50	18.65	18.02	16.46	16.05	17.54
7004	THM TH10 TCB	DGC	19.38	19.34	19.94	21.20	17.90	17.73	18.06
7005	THM TH04 STI	DGC	17.19	16.76	17.37	16.70	15.39	14.87	16.35
7006	THM TH05 SBO	DGC	17.42	16.68	16.65	16.35	15.83	15.47	16.25
7007	QA-X Thruster	DGC	19.66	19.65	19.44	19.70	19.35	19.38	19.56
7008	THM TH06 STO	DGC	14.78	13.94	13.57	13.34	12.81	12.53	13.14
7009	THM TH06 SBI	DGC	19.18	18.41	18.10	17.91	16.91	16.58	17.37
7010	THM TH07 STI	DGC	18.08	17.44	17.11	17.10	16.12	16.03	16.44
7011	THM TH08 STO	DGC	19.34	19.23	19.00	18.92	18.99	18.97	19.21
7012	THM TH09 SBI	DGC	21.44	20.93	20.94	01.48	19.98	19.94	20.16
7013	THM TH10 SBO	DGC	18.58	18.39	18.59	19.12	17.58	17.55	17.87
7014	THM TH11 STI	DGC	21.65	21.93	22.75	24.58	19.86	19.70	20.09
7015	THM TH12 SBO	DGC	23.93	24.68	26.86	29.56	22.14	21.84	22.52
7016	THM TH13 STI	DGC	22.21	23.62	25.73	29.30	19.93	19.80	20.26
7017	RBV Beam Ctr Ln	DGC	20.36	19.92	20.16	21.23	19.21	18.12	18.41
7018	THM TH14 STO	DGC	24.12	25.43	29.64	35.01	21.24	21.17	21.41
7019	NBR Rad Outbd B4	DGC	2.72	2.93	2.44	2.65	1.60	1.59	1.79
7020	THM TH15 SBI	DGC	23.07	25.50	27.07	31.03	20.10	20.23	20.21
7021	THM TH16 STI	DGC	23.20	25.40	25.87	29.22	20.49	20.60	21.08
7022	THM TH17 SBI	DGC	21.77	23.74	23.75	25.97	19.32	18.68	20.48
7023	THM TH18 SBO	DGC	21.67	23.36	23.69	25.27	20.22	20.64	21.08
7030	THM TH03 BVR	DGC	15.50	15.14	15.59	18.08	14.53	13.99	15.19
7033	THM TH12 BVR	DGC	23.05	24.59	27.14	31.18	21.80	21.69	22.37
7035	THM TH19 BVR	DGC	19.53	20.39	20.20	21.03	17.85	18.17	18.18
7040	THM TH01 TCB	DGC	19.42	19.72	19.96	19.66	17.86	17.85	18.72
7041	THM TH02 TCB	DGC	17.55	17.39	17.42	16.94	16.14	15.93	16.95
7042	THM TH03 TCB	DGC	16.85	16.32	18.04	17.08	15.73	14.83	17.20
7043	THM TH04 TCB	DGC	19.90	18.33	18.16	19.16	18.02	18.22	19.18
7044	THM TH05 TCB	DGC	16.42	15.75	15.44	15.17	14.71	14.33	14.98
7045	THM TH07 TCB	DGC	17.76	17.33	17.01	16.92	16.45	16.27	16.73
7046	THM TH09 TCB	DGC	19.30	18.81	18.82	19.31	17.99	18.09	18.28
7048	THM TH11 TCB	DGC	23.27	23.74	24.00	27.06	21.92	21.63	22.12
7049	THM TH12 TCB	DGC	23.04	23.94	26.83	30.89	20.65	20.52	21.07
7050	THM TH13 TCB	DGC	22.89	24.67	27.61	31.99	20.25	20.03	20.52
7051	THM TH14 TCB	DGC	25.07	27.69	31.17	36.18	21.86	21.85	22.10
7052	THM TH16 TCB	DGC	23.22	24.29	25.62	29.18	20.32	20.44	21.23
7053	THM TH17 TCB	DGC	23.52	24.86	25.00	26.83	21.34	21.64	22.45
7054	THM TH18 TCB	DGC	20.01	20.99	21.41	21.17	18.45	19.21	20.77
7060	THM Shutter By 1	DEG	22.54	20.65	27.36	34.93	6.12	5.69	16.56
7061	THM Shutter By 2	DEG	19.34	21.13	17.99	11.72	5.45	7.44	13.66
7062	THM Shutter By 3	DEG	22.75	11.99	28.91	19.01	2.41	0.00	21.45
7063	THM Shutter By 4	DEG	33.89	33.90	32.90	27.37	26.43	25.98	30.41
7064	THM Shutter By 5	DEG	7.30	2.90	2.42	1.79	0.57	0.58	0.58
7065	THM Shutter By 7	DEG	17.06	14.11	8.88	6.89	4.13	5.45	6.85
7067	THM Shutter By 9	DEG	33.75	34.12	33.70	36.71	30.72	30.75	30.73
7068	THM Shutter By 10	DEG	37.46	37.09	40.64	48.39	28.75	27.55	29.32
7069	THM Shutter By 11	DEG	52.25	17.39	22.81	40.32	4.85	5.91	9.14
7070	THM Shutter By 12	DEG	61.39	67.46	80.70	83.62	47.25	46.31	49.55
7071	THM Shutter By 13	DEG	63.60	74.14	8.189	81.89	46.19	44.26	46.49
7072	THM Shutter By 14	DEG	59.44	72.14	72.91	71.60	34.97	33.71	36.82
7073	THM Shutter By 15	DEG	67.79	82.12	83.87	83.96	51.15	52.89	51.29
7074	THM Shutter By 16	DEG	45.20	61.13	68.30	76.03	33.70	33.62	43.22
7075	THM Shutter By 17	DEG	57.98	67.62	68.67	78.13	41.29	42.70	51.96
7076	THM Shutter By 18	DEG	40.49	45.84	47.49	46.15	28.18	33.82	45.42
7080	THM Q1 T Zenor V	VDC	4.85	4.85	4.85	4.85	4.85	4.85	4.85
7081	THM Q2 T Zenor V	VDC	4.90	4.90	4.90	4.90	4.90	4.90	4.90
7082	THM Q3 T Zenor V	VDC	5.05	5.05	5.04	5.04	5.03	5.03	5.03
7083	THM Q1 S Zenor V	VDC	4.97	4.96	4.96	4.97	4.96	4.95	4.95
7084	THM Q2 S Zenor V	VDC	4.98	4.98	4.98	5.00	4.98	4.97	4.98
7085	THM Q3 S Zenor V	VDC	5.15	5.15	5.15	5.15	5.15	5.15	5.15
7090	THM PSM Mount	DGC	21.02	21.71	21.28	22.79	18.36	18.43	18.93
7091	THM Ind Attitude	DGC	17.79	17.24	16.95	16.98	15.70	15.45	16.00
7092	THM RBV Radiator	DGC	18.01	16.24	16.71	18.06	14.44	14.23	14.84
7093	THM RBVC Ctr Am	DGC	20.74	19.31	19.44	20.64	17.36	17.18	17.53
7094	THM WBVT R Root	DGC	13.77	15.73	13.90	14.91	11.35	11.20	11.88
7095	THM WBVT R Rad Ctr	DGC	3.64	5.55	4.45	5.38	3.21	3.24	3.38
7096	THM WBVT R Strap	DGC	15.90	17.63	15.29	15.08	12.60	12.69	13.46
7097	THM WB Mt Bay 1	DGC	22.91	22.40	16.47	16.44	14.87	15.00	15.77
7098	THM WB Mt Bay 1	DGC	22.07	20.14	16.20	16.59	14.46	14.60	15.32
7099	THM WBVT R Sep 3	DGC	18.03	18.12	17.79	17.39	15.58	15.20	16.60
7100	THM WBVT R Sep 17	DGC	21.83	23.51	22.98	24.85	19.00	19.11	19.99
7101	THM WBVT R 1 Cent	DGC	22.45	23.78	20.33	20.91	17.45	17.40	18.44
7102	THM WBVT R 2 Bay	DGC	17.34	17.29	17.04	16.92	15.21	14.88	15.88
7103	THM WBVT R 2 Bay 15	DGC	21.77	23.87	23.50	26.26	19.41	18.47	18.95
7104	THM WBVT R 2 Ctr	DGC	20.74	22.34	19.94	21.14	16.58	16.46	17.28
7105	THM NBTR B Sep 6	DGC	27.82	17.86	17.20	17.87	15.46	15.37	15.96
7106	THM NBTR B Sep 1	DGC	22.11	23.85	24.92	28.10	19.19	19.03	19.55
7107	THM NBTR Bm Ctr	DGC	20.32	21.21	20.59	21.00	17.45	17.20	17.80
7108	THM MSS Mount 14	DGC	20.59	22.86	23.83	26.90	18.03	17.73	18.40
7109	THM OA - Y Thruster	DGC	25.64	27.51	29.91	36.27	21.67	21.43	21.78
7110	THM MSS WBVT R Bm	DGC	16.75	18.21	16.84	17.55	14.26	13.97	14.88
7111	THM OA +X Thruster	DGC	20.33	20.43	17.54	17.84	16.00	16.20	16.67
7130	THM Aux P1 T	DGC	34.18	29.67	12.01	8.87	17.67	8.29	9.03
7131	THM Aux P2 T	DGC	2.90	6.97	28.16	8.49	7.59	25.94	8.03

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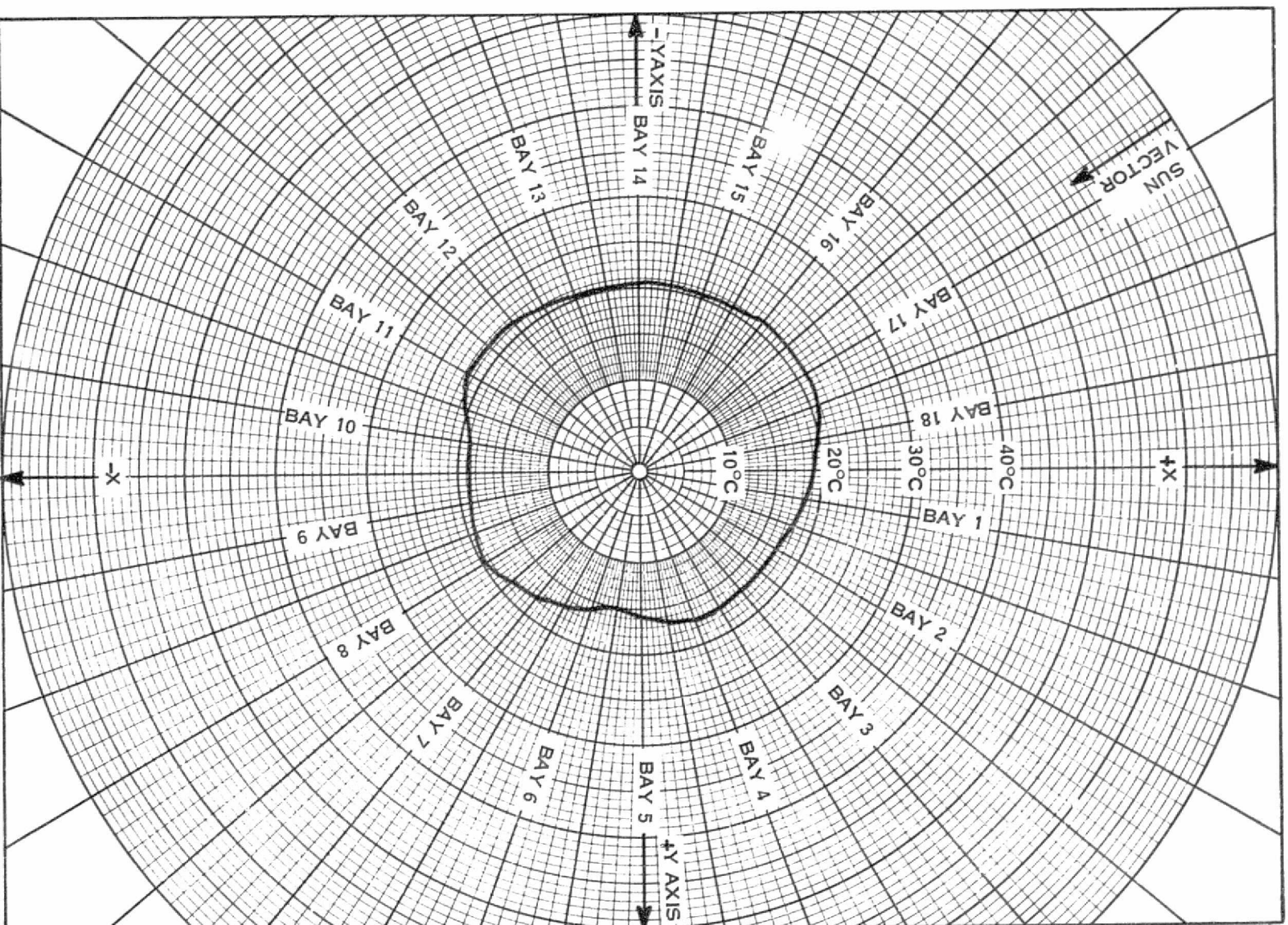


Figure 11-1. Landsat 2 Sensor Ring Average Temperatures
Orbit 17711 15 July 1978

Table 11-2. Landsat-2 Compensation Load History

Compensation Load Status*								
Orbits	1	2	3	4	5	6	7	8
Launch	0	0	0	0	0	0	0	0
2	X	X	X	X	X	0	X	X
237	X	X	X	X	X	0	0	0
272	X	X	X	X	X	0	X	X
306	X	X	0	X	X	0	0	0
572	X	X	0	X	X	0	0	X
1367	X	X	X	X	X	0	0	X
1645	X	X	0	X	X	0	0	X
1657	X	X	X	X	X	0	0	X
4202	0	0	X	X	0	0	0	0
4372	0	0	X	X	0	0	0	X
6735	0	X	X	0	0	X	0	0
8312	X	X	0	0	X	0	0	0
9753	X	X	0	0	0	0	0	0
14727	0	0	0	0	0	0	0	0

*NOTE X = ON
0 = OFF

SECTION 12

NARROWBAND TAPE RECORDERS (NBR)

LANDSAT-2

SECTION 12
NARROWBAND TAPE RECORDERS (NBR)

The Narrowband Recorder Subsystem operated satisfactorily throughout the entire period, both Recorders alternating in Record and Playback modes with a nominal one minute overlap.

Table 12-1 gives cumulative operating hours for both Recorders by mode, and Table 12-2 gives typical telemetry values.

Table 12-1. NBR Operating Hours by Mode

NBR	ON	OFF	PLAYBACK	RECORD
A	16127	14541	644	15483
B	16127	14541	644	15483

Table 12-2. Narrowband Tape Recorder Telemetry Values, Landsat-2

Func	Name	Units	Orbits						
			36/37	4980/4981	11460/11461	15211/15212	1678/79	17328/40	17715/39
10001	A - Motor I Record P/B	mA	132.0	130.2	125.50	114.68	120.63	122.22	117.46
			108.0	93.7	92.30	99.47	85.71	87.32	80.95
10101	B - Motor I Record P/B	mA	148.5	135.7	129.10	119.27	111.55	111.55	114.57
			143.6	135.7	127.65	119.09	111.55	110.05	107.04
10002	A - Pwr Sup. I Record P/B	mA	170.5	162.5	152.13	152.92	149.34	152.63	149.34
			410.0	399.3	472.26	386.14	382.88	398.10	376.32
10003	B - Pwr Sup. I Record P/B	mA	260.0	264.5	264.47	270.12	267.69	264.51	267.69
			481.0	489.2	479.90	479.70	486.08	486.08	476.57
10103	A - Rec. Temp.	DGC	26.1	24.2	21.64	25.40	23.51	20.53	22.02
10103	B - Rec. Temp.	DGC	27.0	26.2	24.71	23.68	22.02	24.36	23.72
10004	A - Pwr Sup	VDC	-24.87	-25.1	-25.09	-25.08	-24.80	-25.10	-25.10
10104	B - Pwr Sup	VDC	-24.55	-24.6	-24.61	-24.73	-24.50	-24.75	-24.50

SECTION 13
WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-2

SECTION 13
WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-2

The WBTS has operated nominally in this report period.

Table 13-1 shows typical telemetry values. All are nominal.

Singal levels measured at Goldstone with the spacecraft successively at the same two points in space show continuous satisfactory performance.

Table 13-1. Typical Wideband Subsystem Telemetry

Func	Name	Units	Orbit						
			47	5091	10641	15211	16985	17328	17700
12001	Temp TWT Coll.	DGC	34.38	F	33.18	33.12	33.26	35.00	F
12101			30.00	32.16	34.65	30.00	31.47	29.69	26.25
12002	Cur. Helix	mA	4.29	F	F	3.90	3.87	3.90	F
12102			4.41	4.59	4.61	4.70	4.79	4.82	4.46
12003	Cur. Cath.	mA	46.04	F	F	44.93	44.93	44.82	F
12103			46.42	46.00	44.07	44.62	44.58	45.79	45.14
12004	Fwd. Pwr.	dBm	42.93	F	F	42.87	42.89	42.87	F
12104			43.81	43.61	43.51	43.61	43.66	43.70	43.36
12005	Refl. Pwr.	dBm	26.50	F	F	25.44	25.44	25.44	F
12105			37.50	37.08	36.90	37.17	37.44	37.44	36.02
12227	Mod. A Loop Stress	Hz	2.14	F	1.60	1.77	1.39	1.64	0.75
12228	Mod. B Loop Stress	Hz	1.51	- 0.22	0.28	- 0.66	- 0.25	- 0.25	- 0.93
12229	Temp. Mod	DGC	18.51	17.97	17.41	16.00	18.00	16.00	18.44
12232	+15 VDC Pwr Sply	TMV	2.65	2.65	2.65	2.65	2.65	2.65	2.65
12234	-15 VDC Pwr Sply	TMV	4.27	4.04	3.99	4.10	4.11	4.05	4.19
12236	+5 VDC Pwr Sply	TMV	3.57	3.51	3.50	3.55	3.55	3.55	3.53
12238	-5 VDC Pwr Sply	TMV	4.20	4.07	4.02	4.08	4.09	4.07	4.11
12240	-24 VDC Unreg Pwr	TMV	6.20	5.90	5.92	5.92	5.97	5.85	6.02
12242	Temp. Inv.	DGC	24.12	22.53	22.18	22.17	20.64	21.14	21.26

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)
LANDSAT-2

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)

The AMS is a passive radiometric balance sensor which operates in the 14-16 micron IR band. AMS Telemetry Values are shown in Table 14-1.

The AMS was launched in the OFF mode (CMD 774), turned ON during Orbit 6, and has been performing normally since then.

Table 14-1. Landsat-2 AMS Temperature Telemetry

Func	Name	Units	Orbit Number						
			50	5102	10191	15211	16861	17300	17711
3004	Case Temp 1	DGC	19.00	18.68	18.36	18.67	17.41	17.24	17.50
3005	Assembly - Temp 2	DGC	18.70	18.30	17.97	18.28	17.02	16.92	17.23

SECTION 15
WIDEBAND VIDEO TAPE RECORDERS (WBVTR)
LANDSAT-2

SECTION 15
WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

WBVTR-1 has not been in use during this reporting period because of failures of two of its Record/Playback heads (head 1, Orbit 2683, 3 August 1975; head 3, Orbit 10064 on 13 January 1977).

Twice in 1975, for an undetermined reason, WBVTR-2 stopped Rewind prematurely: once during Orbit 1913 on 9 June and again during Orbit 3854 on 26 October. This abnormality has not occurred since.

On 21 December 1976, during Orbit 9738, a playback of MSS data from WBVTR-2 of Landsat-2 was unusable due to high bit error counts. This anomaly has been experienced many times since then. (See Table 15-1.) The condition exists due to a tape overspeed of approximately 27%, caused by the servo voltage input being zero during the time of the anomaly.

One possible cause is a record/playback relay which applies the servo voltage signal to the playback circuit through the normally closed, spring loaded contacts.

Activation of this relay during the anomaly, by commanding record for six seconds then returning to playback (Toggle sequence) has always cleared the improper operation. To date, it has never been necessary to use this procedure more than once in any one orbit. A few times the fault has cleared itself and in Orbit 17269, 14 June 1978, the fault cleared itself twice. Usually, the fault exists at the beginning of playback but many times it has occurred during playback. Though it has occurred more frequently in the past few months, it does not seem to be following a pattern of progressive degeneration.

The following data is supplied for information.

The anomaly has occurred in the listed orbits in Table 15-1.

Data in Table 15-2 indicates that the problem is independent of tape position. (The control track determines servo voltage value.)

From Orbit 15690, 2 February 1978, to Orbit 17454, 27 June 1978, 240 playbacks were taken. It was necessary to toggle 9 times. The next 33 playbacks to Orbit 17454 it was necessary to toggle only twice.

Table 15-3 gives typical non-modal telemetry values for WBVTR-1 and WBVTR-2. Tables 15-4 and 15-5 show the modal telemetry values for Record, Playback, Rewind, and Standby operational modes.

Figure 15-1 shows tape usage for WBVTR-2.

Table 15-1. Playback Orbits Affected

Orbit	Orbit	Orbit
9738	15593	17185
9749	15621	17186
9930	15721	17188
10199	16435	17216
10466	16472	17240
11635	16969	17243
12191	16964	17353
12377	16972	17453
13924	17101	
14630	17129	
15354	17174	

Table 15-2. Tape Footage
During Playback

Orbit	Start Playback	Problem High Error	Toggle Good
16959	690	690	931
17101	760	760	831
17129	906	950	1405
17174	989	989	1264
17185	1190	1200	1304
17186	728	728	785

Table 15-3. Telemetry Values for WBVTR-1 and 2

Func	Name	Units	Orbits					
			45/46	4879	11871	16979	17437	17715
13022	Tape Unit Pres	PSI	16.52	16.39	16.12	15.99	15.99	15.99
13023	Tape Unit Temp	DGC	20.74	20.12	16.69	15.92	15.92	16.30
13024	Elec U. Temp	DGC	25.00	21.68	13.85	13.85	13.85	13.46
13032	Limiter Volt	VPP	1.48	1.41	F	F	F	F
13034	+5.6 VDC Conv	VDC	5.70	5.67	F	F	F	F
13122	Tape Unit Press	PSI	16.12	15.33	14.54	13.35	13.35	13.35
13123	Tape Unit Temp	DGC	21.50	23.08	19.92	17.84	18.61	17.46
13124	Elect. U. Temp	DGC	23.50	22.72	16.63	18.07	19.61	16.92
13132	Limiter Volt	VPP	1.30	1.28	1.34	1.33	1.34	1.34
13134	+5.6 VDC Conv	VDC	5.71	5.85	5.66	5.62	5.80	5.80

F = Unit Off

Table 15-4. Function Values by Mode, Landsat-2 WBVTR-1 Telemetry

Func	Name	Units	Orbits					
			31/46	2642	4878	7628/7643	10050/10081	10249*
13029	Input P/B Voltage	VPP						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		0.60	0.32	0.30	0.32	0.35	0.35
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13028	Capstan Motor I	AMP						
	Record		0.31	0.33	0.31	0.33	0.31	0.32
	Playback		0.26	0.31	0.30	0.35	0.30	0.35
	Rewind		0.19	0.23	0.28	0.31	0.28	0.30
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13030	Headwheel Motor I	AMP						
	Record		0.50	0.50	0.53	0.50	0.56	0.52
	Playback		0.49	0.49	0.53	0.53	0.44	0.45
	Rewind		0.44	0.44	0.47	0.47	0.45	0.44
	Standby		0.45	0.45	0.46	0.44	0.44	0.44
13031	Recorder Input I	AMP						
	Record		3.69	3.69	3.62	3.62	3.62	3.52
	Playback		3.37	3.86	3.86	3.34	3.86	3.86
	Rewind		2.23	2.19	2.23	2.28	2.23	3.21
	Standby		1.78	1.95	1.95	1.81	1.95	1.86
13033	Servo Voltage	PCT						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		50.01	50.08	50.37	50.04	49.61	50.08
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13026	Capstan Motor Spd	PCT						
	Record		88.61	88.03	85.13	85.03	87.45	88.61
	Playback		88.35	86.87	85.13	87.45	94.90	88.87
	Rewind		100.2	98.48	96.73	98.48	96.00	96.52
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13027	Headwheel Mo Spd	PCT						
	Record		96.72	95.07	93.96	94.07	94.16	94.28
	Playback		97.28	94.52	92.86	92.86	94.44	94.80
	Rewind		98.6	96.73	96.73	96.73	96.73	96.60
	Standby		98.39	95.62	95.07	93.96	95.07	93.96

* Unit not used since Orbit 10249.

Table 15-5. Function Values by Mode - Landsat-2 WBVTR-2 Telemetry

Func	Name	Units	Orbits						
			31/46	4878	10198/10199	15303/15286	16979	17437	17115
13129	Input P/B Voltage	VPP							
	Record		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Playback		0.35	0.34	0.34	0.33	0.36	0.31	0.31
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0	0.0
13128	Capstan Motor I	AMP							
	Record		0.33	0.38	0.32	0.34	0.36	0.34	0.32
	Playback		0.33	0.35	0.35	0.36	0.32	0.32	0.32
	Rewind		0.20	0.15	0.18	0.18	0.15	0.13	0.15
	Standby		0.0	0.0	0.0	0.0	0.0	0.0	0.0
13130	Headwheel Motor I	AMP							
	Record		0.47	0.48	0.49	0.47	0.48	0.49	0.50
	Playback		0.48	0.48	0.49	0.47	0.48	0.48	0.47
	Rewind		0.44	0.41	0.43	0.41	0.40	0.40	0.41
	Standby		0.43	0.41	0.44	0.40	0.39	0.40	0.41
13131	Recorder Input I	AMP							
	Record		2.90	2.90	2.90	2.93	2.87	2.96	2.96
	Playback		3.14	3.11	3.20	3.11	3.17	3.20	3.11
	Rewind		1.80	1.80	1.80	1.78	1.71	1.73	1.71
	Standby		1.51	1.62	1.49	1.48	1.57	1.60	1.55
13133	Servo Voltage	PCT							
	Record		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Playback		49.00	49.43	49.45	49.71	49.62	49.81	49.72
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0	0.0
13126	Capstan Motor Spd	PCT							
	Record		112.10	105.33	105.30	103.96	104.65	103.96	103.96
	Playback		112.10	103.96	105.07	102.59	102.59	102.59	102.59
	Rewind		120.43	117.68	117.14	116.31	116.31	116.31	115.62
	Standby		0.0	0.0	0.0	0.0	0.0	0.0	0.0
13127	Headwheel Mo Spd	PCT							
	Record		98.08	95.48	95.01	93.40	94.44	94.44	93.40
	Playback		97.04	94.44	94.80	93.40	92.40	93.40	92.88
	Rewind		98.6	96.52	96.81	94.44	94.44	94.44	93.92
	Standby		100.79	96.00	95.95	94.96	94.44	94.44	94.44

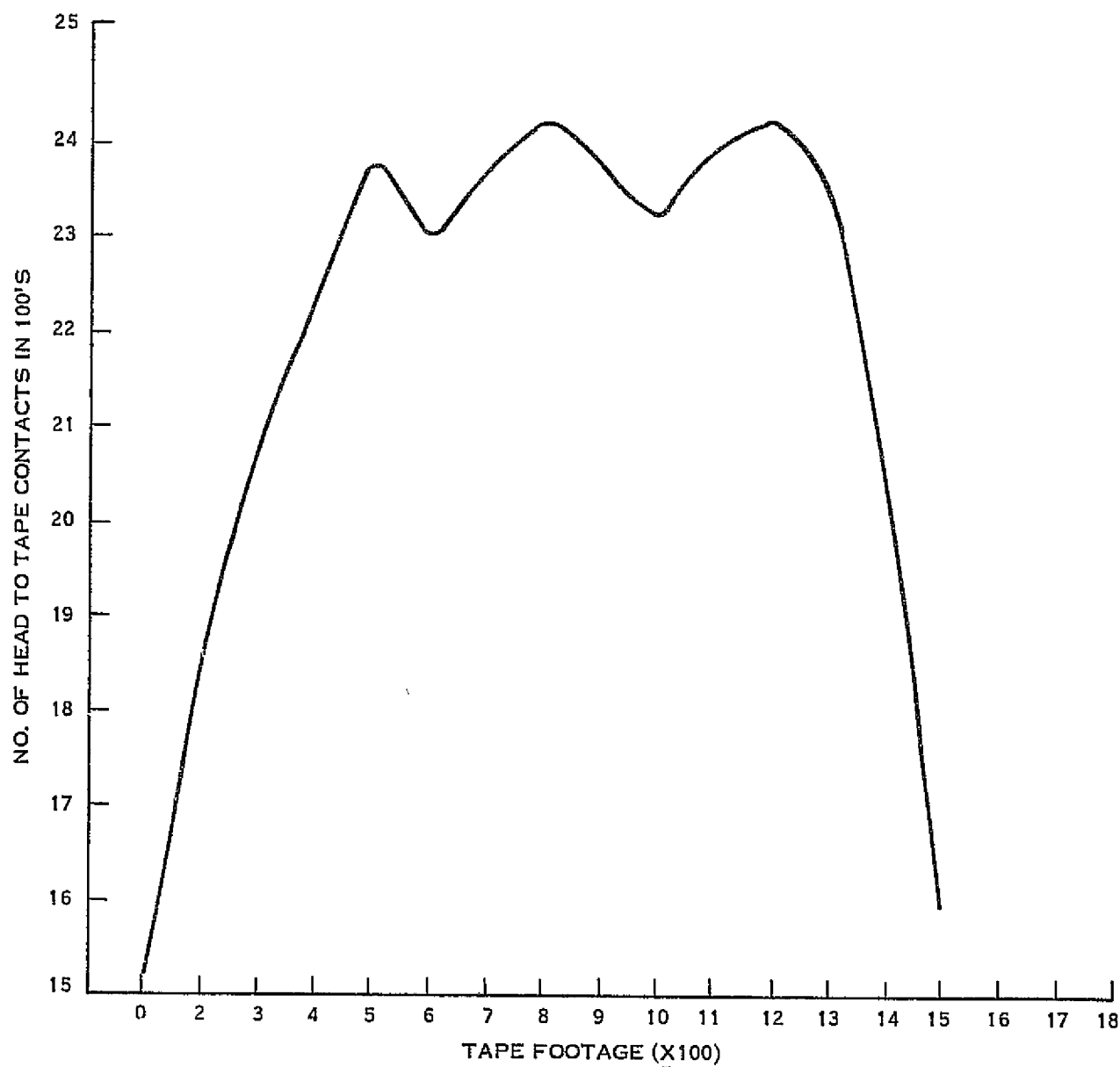


Figure 15-1. Landsat-2 WBVTR-2 Tape Usage thru Orbit 17673

SECTION 16
RETURN BEAM VIDICON (RBV)
LANDSAT-2

SECTION 16
RETURN BEAM WIDICON (RBV)

RBV was used in the real-time mode only during this report period. Telemetry data was normal.

Table 16-1 gives typical telemetry values for the RBV Subsystem. Tables 16-2, 16-3 and 16-4 give telemetry values for Prepare, Read and Hold modes of the three RBV cameras.

Table 16-1. RBV Telemetry Values

Func	Name	Units	Orbits						
			54	5662	10157	15228	16985	17328	17739
14001	CCC Broad Temp.	DGC	19.65	20.41	20.15	21.57	18.28	18.83	18.28
14002	CCC Pwr. Sup. Temp	DGC	20.52	20.80	20.17	22.79	19.39	19.39	18.83
14003	15 VDC Sup.	TMV	3.92	4.00	3.84	3.77	3.92	3.92	3.92
14004	+6V, -5.25 VDC Sup.	TMV	2.92	3.13	3.03	2.93	3.05	3.07	3.05
14100	* VID Output V	TMV	N	0.70	1.95	1.18	1.75	0.87	1.15
14200			1.05	1.26	0.88	1.18	1.90	2.30	0.67
14300			1.03	1.31	1.10	1.17	1.40	1.00	0.70
14102	* Comb. Align Cur.	TMV	3.85	3.82	3.70	3.85	3.80	3.95	3.80
14202			3.91	3.88	3.92	3.91	3.87	3.97	3.97
14302			3.90	3.83	3.75	3.74	3.85	3.85	3.85
14103	* Elec Temp.	DGC	24.24	26.51	23.00	29.43	22.15	23.26	22.70
14203			19.84	22.05	20.18	19.86	19.28	20.39	19.28
14303			25.05	29.42	23.42	35.07	22.60	24.81	22.60
14104	* LV Pwr Sup T.	DGC	23.44	26.28	23.15	28.66	22.81	23.36	21.70
14204			18.14	20.61	18.90	18.07	19.39	19.94	17.18
14304			25.56	29.47	24.00	35.25	24.91	25.47	23.26
14105	* Defl. Pwr. Sup. +10 VDC	TMV	4.00	3.96	3.84	3.84	3.97	4.00	4.00
14205			3.97	3.94	3.82	3.81	3.95	3.97	3.95
14305			4.00	3.96	3.96	4.00	4.00	4.00	4.00
14106	* L.V.P.S. +6V, -6.3 VDC	TMV	3.67	3.63	3.26	3.54	3.67	3.67	3.67
14206			3.65	3.62	3.34	3.50	3.63	3.65	3.65
14306			3.70	3.68	3.42	3.72	3.72	3.70	3.70
14107	* Ther. Elec. Cur.	TMV	2.61	2.61	2.60	2.51	2.52	2.52	2.77
14207			2.49	2.51	2.44	2.40	2.47	2.47	2.60
14307			2.57	2.57	2.71	2.44	2.47	2.47	2.72
14108	* Vid. Fil. Cur.	TMV	2.43	2.50	2.46	2.44	2.55	2.55	2.55
14208			2.40	2.36	2.39	2.30	2.40	2.40	2.40
14308			2.58	2.54	2.59	2.47	2.57	2.55	2.60
14110	* Vid. Tgt. Volt	TMV	2.98	2.96	2.98	2.98	2.97	2.97	2.97
14210			2.86	2.96	2.60	2.88	3.00	3.10	3.00
14310			2.63	2.58	2.37	2.52	2.62	2.62	2.62
14113	* Vert Def V	TMV	2.92	2.81	2.98	2.79	3.95	2.90	3.35
14213			3.15	3.05	3.16	3.12	4.15	3.12	3.10
14313			3.59	3.44	3.04	3.47	4.00	4.00	4.00
14114	* Vid FFT	DGC	19.87	19.21	19.85	19.82	21.99	21.99	21.99
14214			20.55	19.80	20.46	20.24	21.06	20.54	20.54
14314			20.65	19.56	20.38	21.67	22.40	22.40	22.40
14115	* Foc Coil T	DGC	21.04	21.31	21.02	21.41	17.07	17.07	17.07
14215			20.67	21.26	19.17	21.06	17.62	17.62	17.62
14315			22.25	22.89	20.61	24.14	18.62	18.62	18.62

* - 141XX Refers to Camera 1
 142XX Refers to Camera 2
 143XX Refers to Camera 3
 N - Data not available

Table 16-2. Camera #1 (Blue) Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbits						
				054	5663	10157	15228	16985	17328	17739
14101	Focus I	TMV	Prep	1.68	1.74	1.67	1.77	1.70	1.72	1.67
			Read	2.80	2.85	2.80	2.90	2.80	2.85	2.80
			Hold	0.65	0.69	0.65	0.75	0.65	0.67	0.65
14109	Grid V	TMV	Prep	0.80	0.78	0.80	0.77	0.77	0.80	0.80
			Read	2.42	2.42	2.45	2.45	2.42	2.42	2.42
			Hold	3.95	3.98	3.95	3.97	3.97	3.97	3.95
14111	Cath I	TMV	Prep	3.05	3.02	3.05	3.02	3.02	3.02	3.02
			Read	0.83	0.83	0.85	0.82	0.82	0.82	0.82
			Hold	0.38	0.37	0.37	0.37	0.37	0.37	0.37
14112	Hor Def	TMV	Prep	1.75	1.77	1.77	1.77	1.77	1.77	1.77
			Read	3.25	3.25	3.21	3.25	3.22	3.25	3.22
			Hold	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14120	+500 V	TMV	Prep	0.85	0.90	0.92	0.90	0.90	0.90	0.95
			Read	4.05	4.05	4.05	4.05	4.02	4.05	4.02
			Hold	4.05	4.05	4.05	4.05	4.02	4.02	4.02

Table 16-3. Camera #2 (Yellow) Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbits						
				054	5663	10157	15228	16985	17328	17739
14201	Focus I	TMV	Prep	1.56	1.54	1.50	1.50	1.50	1.55	1.50
			Read	2.65	2.65	2.65	2.65	2.65	2.65	2.62
			Hold	0.54	0.53	0.54	0.50	0.52	0.55	0.50
14209	Grid V	TMV	Prep	0.75	0.80	0.80	0.75	0.77	0.77	0.77
			Read	2.25	2.22	2.25	2.20	2.20	2.20	2.25
			Hold	4.05	4.11	4.11	4.10	4.10	4.10	4.07
14211	Cath I	TMV	Prep	3.05	3.05	3.05	3.05	3.05	3.05	3.05
			Read	0.95	0.95	0.95	0.95	0.95	0.95	0.95
			Hold	0.37	0.35	0.35	0.35	0.35	0.35	0.35
14212	Hor Def	TMV	Prep	1.85	1.87	1.87	1.85	1.85	1.87	1.85
			Read	3.25	3.31	3.24	3.30	3.30	3.30	3.30
			Hold	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14220	+500V	TMV	Prep	1.15	1.14	1.15	1.12	1.12	1.12	1.12
			Read	4.25	4.27	4.27	4.27	4.27	4.27	4.27
			Hold	4.25	4.27	4.27	4.27	4.27	4.27	4.27

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			Hold	0.37	0.35	0.35	0.35	0.35	0.35	0.35
14212	Hor Def	TMV	Prep	1.85	1.87	1.87	1.85	1.85	1.87	1.85
			Read	3.25	3.31	3.24	3.30	3.30	3.30	3.30
			Hold	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14220	+500V	TMV	Prep	1.15	1.14	1.15	1.12	1.12	1.12	1.12
			Read	4.25	4.27	4.27	4.27	4.27	4.27	4.27
			Hold	4.25	4.27	4.27	4.27	4.27	4.27	4.27

Table 16-4. Camera #3 (Red) Telemetry (Values in TMV)

Func	Name	Units	Mode	Orbit						
				054	5663	10157	15228	16985	17328	17739
14301	Focus I	TMV	Prep	1.79	1.85	1.77	1.95	1.77	1.80	1.77
			Read	2.85	2.93	2.85	3.02	2.85	2.87	2.85
			Hold	0.65	0.72	0.69	0.80	0.65	0.67	0.67
14309	Grid V	TMV	Prep	0.75	0.75	0.77	0.77	0.77	0.77	0.77
			Read	2.65	2.66	2.66	2.72	2.70	2.70	2.67
			Hold	4.08	4.13	4.12	4.12	4.10	4.10	4.10
14311	Cath I	TMV	Prep	3.25	3.22	3.23	3.22	3.22	3.22	3.22
			Read	0.54	0.55	0.55	0.55	0.55	0.55	0.55
			Hold	0.39	0.40	0.40	0.40	0.40	0.40	0.40
14312	Hor Def	TMV	Prep	2.05	2.07	2.07	2.07	2.02	2.02	2.02
			Read	3.25	3.42	3.42	3.40	3.40	3.40	3.40
			Hold	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14320	+500 V	TMV	Prep	1.15	1.15	1.15	1.15	1.15	1.15	1.15
			Read	4.25	4.27	4.27	4.27	4.25	4.25	4.25
			Hold	4.25	4.27	4.27	4.27	4.25	4.25	4.25

SECTION 17
MULTISPECTRAL SCANNER SUBSYSTEM (MSS)
LANDSAT-2

SECTION 17
MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

The MSS Subsystem has operated nominally in this period. Figure 17-1 shows the number of scenes imaged at each geographic location this quarter. Only those scenes received by U.S. and Pakistan ground stations are shown. Scenes transmitted to Canada, Brazil and Italy (52% of total) are not shown.

Table 17-1 shows typical telemetry values since launch. All are nominal.

Table 17-2 shows the history of sensor response to a constant input radiance level. Each sensor is sampled at 5 radiance levels and all show essentially the same trends. Only one of these levels (the second highest) is listed in Table 17-2. Line length history is also shown in Table 17-2. It is well within satisfactory limits. Sensor responses and line lengths this quarter are also satisfactory.

Sun calibrations, performed every two weeks, show nominal performance.

Table 17-1. MSS Telemetry - Landsat-2

Func	Name	Units	Orbits						
			27	5091	10192	15211	16802	17272	17712
15040	MUX -6 V	TMV	4.05	4.04	4.05	4.05	4.05	4.00	4.05
15041	A/D SUPPLY	TMV	5.95	5.95	5.95	5.95	5.95	5.93	5.95
15042	AVERAGE DENSITY DATA TRANS	TMV	1.71	1.95	2.62	1.98	2.39	2.22	2.03
15043	FIBER OPTICS PLATE 1 TEMP	DGC	18.13	21.75	20.15	21.04	16.84	17.74	17.74
15044	FIBER OPTICS PLATE 2 TEMP	DGC	17.87	20.28	18.54	19.50	14.82	15.84	15.85
15045	MUX TEMP	DGC	23.38	23.63	24.68	28.27	19.08	20.80	19.91
15046	ELEC COVER TEMP	DGC	20.25	22.96	20.01	21.02	16.32	17.52	17.26
15047	PWR. SUP. TEMP	DGC	19.45	21.62	20.66	21.75	16.32	17.59	17.22
15048	SCAN MIR REG. TEMP	DGC	18.30	21.13	20.94	22.37	15.87	17.07	16.61
15049	SCAN MIR DRIVE ELEC. TEMP	DGC	18.96	21.42	21.25	22.64	16.00	17.35	16.79
15050	SCAN MIR DRIVE COVER TEMP	DGC	17.26	21.21	20.85	22.25	15.89	17.01	16.70
15051	SCAN MIR TEMP	DGC	17.26	20.89	20.46	22.06	15.75	16.86	13.52
15052	ROT. SHUT HOUSING TEMP	DGC	23.26	20.28	18.58	19.58	14.86	15.90	15.85
15053	SCAN MIR REG VOLT	TMV	4.70	4.57	4.63	4.63	4.63	4.61	4.57
15054	CAL LAMP CURRENT	TMV	1.17	1.17	1.17	1.17	1.17	1.17	1.17
15055	BAND 1 15 VDC	TMV	4.98	4.97	4.97	4.97	4.97	4.97	4.97
15056	BAND 2 15 VDC	TMV	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15057	BAND 3 15 VDC	TMV	4.95	4.95	4.95	4.95	4.95	4.95	4.95
15058	BAND 4 15 VDC	TMV	5.00	5.00	5.00	5.00	5.00	5.00	5.00
15059	TLM -15 V	TMV	5.06	5.07	5.07	5.07	5.07	5.07	5.07
15060	+12 V/-6 V	TMV	5.03	5.02	5.01	5.02	5.02	5.01	5.01
15061	LOGIC +5 V	TMV	4.81	4.83	4.85	4.83	4.81	4.86	4.84
15062	RECT. +19 V	TMV	5.03	5.05	5.05	5.05	5.05	5.05	5.05
15063	RECT. -19 V	TMV	3.60	3.60	3.60	3.60	3.59	3.59	3.59
15064	BAND 1 HVA	TMV	4.95	4.95	4.95	4.95	4.95	4.95	4.95
15065	BAND 1 HVB	TMV	F	F	F	F	F	F	F
15066	BAND 2 HVA	TMV	4.70	4.75	4.73	4.73	4.72	4.72	4.72
15067	BAND 2 HVB	TMV	F	F	F	F	F	F	F
15068	BAND 3 HVA	TMV	4.72	4.73	4.75	4.75	4.75	4.75	4.75
15069	BAND 3 HVB	TMV	F	F	F	F	F	F	F
15070	SHUT MOT. CONTR. INTEG	TMV	2.60	2.60	2.60	2.58	2.60	2.59	2.59
15071	SCAN MIRROR DRIVE CLOCK	TMV	2.00	2.00	2.01	2.00	2.01	1.97	1.97

F = Unit OFF

Table 17-2. MSS Response History - Landsat-2

Quantum Level for Constant Calibration Lamp Input
(0 = Black; 63 = White)

Band	Sensor	At 1st Turn ON	Average Value in Orbit				% Change Since Launch
			1st Year	2nd Year	3rd Year	1st Q 4th Year	
1	1	43	40	39	38	37	-14
	2	41	40	39	37	36	-12
	3	46	43	42	41	42	- 9
	4	46	45	45	44	43	- 6
	5	44	40	39	38	38	-14
	6	46	43	43	42	42	- 9
2	7	47	45	45	45	45	- 4
	8	44	40	41	41	41	- 7
	9	48	46	46	45	44	- 8
	10	50	48	48	46	47	- 6
	11	48	47	47	47	47	- 2
	12	47	44	44	42	42	-11
3	13	42	40	40	39	39	- 7
	14	44	43	42	41	40	- 9
	15	47	46	47	47	47	0
	16	47	45	46	46	46	- 2
	17	48	46	46	46	47	- 2
	18	46	44	45	45	46	0
4	19	25	25	25	25	25	0
	20	26	27	27	26	26	0
	21	32	32	32	31	31	- 3
	22	29	30	30	29	29	0
	23	32	33	33	32	32	0
	24	28	28	28	28	28	0
Line Length		3250	3249	3248	3246	3240	-0.3

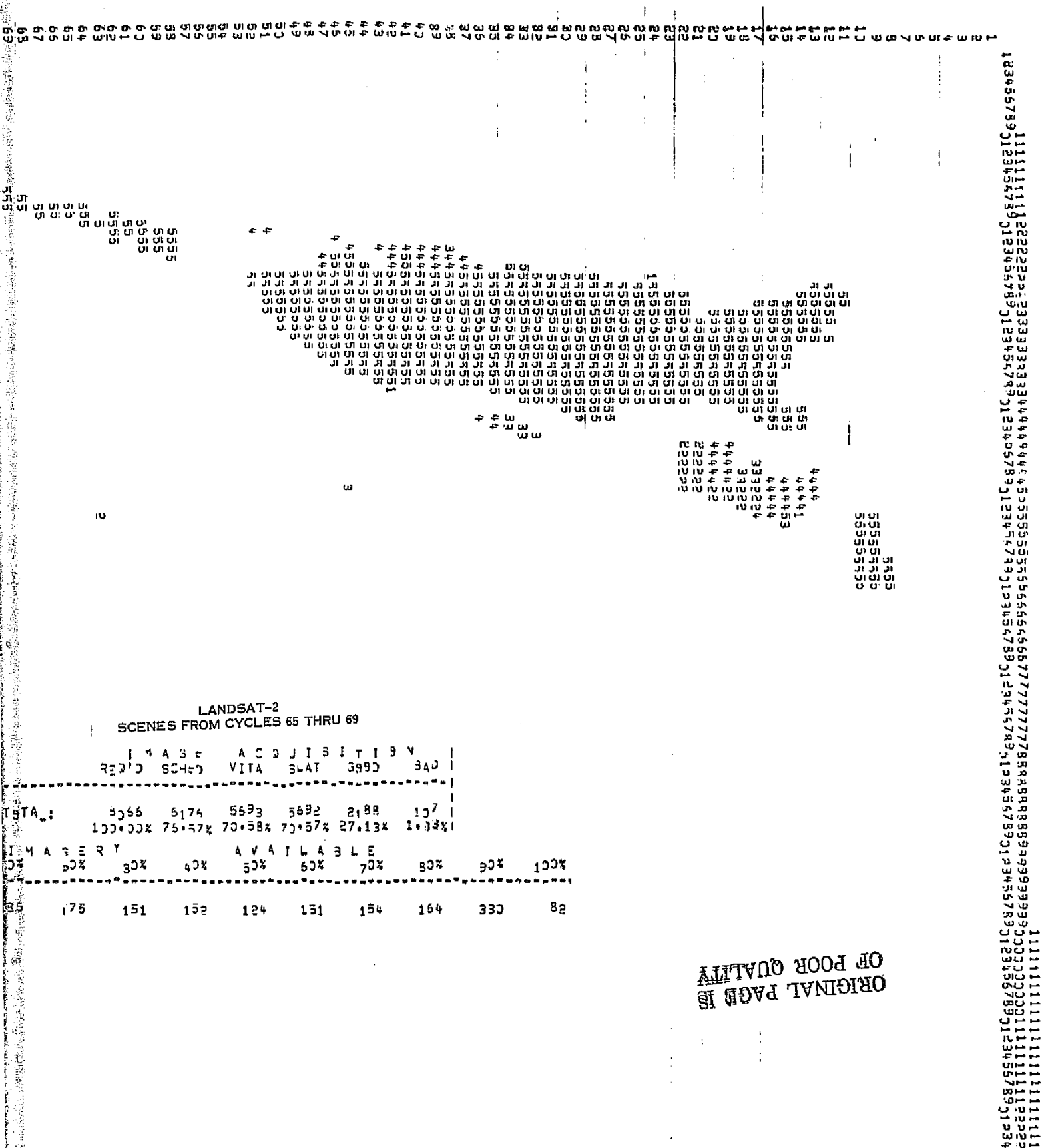


Figure 17-1. Computer Map of MSS Scenes
This Quarter, Landsat-2

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CC3	0.00	0.00	0.00

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191	5555555555555555	11
192	3355555555555555	11
193	5555555555555555	
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196	3355555555555555	22
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250	3355555555555555	11
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SECTION 18
DATA COLLECTION SYSTEM (DCS)
LANDSAT-2

SECTION 18
DATA COLLECTION SUBSYSTEM (DCS)

The DCS Subsystem was turned OFF during Orbit 15857 on 4 March 1978, and the function assumed by Landsat-3. The subsystem is capable of resuming operational status if desired.

APPENDIX A
LANDSAT-2 ANOMALIES AND OBSERVATIONS

Appendix A. Landsat-2 Anomalies and Observations

Date	Anomaly/Observation	How Observed	Comments
Prelaunch	Forward Scanner Pressure Leak	Spacecraft Integration	Before launch pressure increased. After launch pressure decreased. No anticipated effect on Scanner or S/C mission.
Prelaunch	Defective TLM Functions 1264, 4002, 13200	Spacecraft Integration	Functions measure non-critical temperatures. Sensors failed prior to launch. Mission unaffected.
3/8/75	Unencoded command 781, CIU Channel B Off, received by spacecraft from RF interference. Commands 782 or 786, switch comedees; and commands 780 or 784, switch PWM regulator, received at other times.	On-Line	Non-Landsat OCC Authorized Unencoded commands received in Orbit 619, 640, 743, 1575, 1700, 2005, 3164, 4769, 5025, 7925, 8721, 8804, 9523, 9863, 10268, 10466, 10533, 10583, 10603, 13309, 14508, 14864, 15533, 16279.
3/17/75	MMCA Pitch Flux Density TLM Drift	Off-Line	Telemetry decreased 5 counts and indicates increase flux density on charged magnet. Probable sensor drift. No apparent effect on S/C performance.
4/5/75	WBVTR-1 Rewind Failure (MDR E01252)	On-Line	WBVTR-1 failed to execute Rewind command or prematurely terminated rewinds due to false BOT signal. Subsequent commands or Fool-Logic techniques allowed return to operation. Investigation Committee report issued. Problems occurred Orbit 1021, 1532, 1568, 2238. Operation restricted to 300 'hru 1500 feet.
6/9/75	WBVTR-2 had Short Rewind (MDR E01255)	On-Line	WBVTR-2 started rewind but stopped prematurely in Orbit 1919 and again in Orbit 3854. Investigation Committee did not define a probable cause but assigned a momentary False BOT as reason for short rewind. Unit remains operational.
8/3/75	WBVTR-1 data did not provide sync to ground station (MDR D04930)	On-Line	One head circuit of WBVTR-1 failed to operate. 25% of data lost in data stream. Operation discontinued until early 1976, when it was used with RBV only.
11/14/75	MSS False End-of-Line Codes (MDR D04940)	Off-Line	Occasional End-of-Line codes occurring in preamble or along video data. Creates 4 black and 4 white words in scene data. Occurs over magnetic anomalies with low incidence rate. Operation continued.
1/25/76	Solar Array Current Notch (MDR D04934)	On-Line	In Orbit 5123, abnormal drops in solar array current appeared for portion of satellite day. S/C operation unaffected because solar array has excess power to date.
7/20/76	Battery 6 Turned Off	On-Line & Off-Line	Battery 6 decreased in load share and rose in charge share thereby causing overcharge. Temperature increased and unit was turned off in Orbit 7601. (Returned to service in Orbit 7992.) See Table 3-2 for history of all battery restoration cycles.
7/29/76	WBVTR-2 Automatic Shutdown by SMART	On-Line	SMART circuits detected high headwheel currents in Orbit 7720 and shutdown WBVTR-2. WBVTR-2 operation was normal; high headwheel current assigned to slipped phase. Normal operation resumed after reset.
12/21/76	WBVTR-2 had 30% high P/B speed (MDR D04936)	On-Line	Ground equipment would not synch on WBVTR-2 P/B data during Orbit 9738 P/B. Analysis showed P/B speed was 30% high. Toggling, record to P/B, restored normal operation. See Table 15-1 for history.
1/15/77	WBVTR-1 second head failed (MDR D04937)	On-Line	Observation of CRT trace during WBVTR-1 RBV P/B data in Orbit 10086 showed second head failed. Operation discontinued.
9/12/77	Payload Automatic Inhibit from ECAM by SMART	On-Line	SMART circuits detected S/C unreg bus low voltage on Orbit 13342 caused by operation problems. Inhibited further payload operation from ECAM. Reset returned S/C to normal. Recurred during Orbits 14865, 15013, 15156. Reset returned S/C to normal each time.

APPENDIX B

LANDSAT-2 SPACECRAFT ORBIT REFERENCE TABLES

APPENDIX B
LANDSAT-2
SPACECRAFT ORBIT REFERENCE TABLES
FROM JANUARY 1978 THROUGH DECEMBER 1978
ORBIT 14981 TO 20070
FLIGHT DAY 1075 THROUGH 1439

Landsat-2
January 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	1	1075	14981-14994	113-126	9	59
2	2	1076	14995-15008	127-140	10	59
3	3	1077	15009-15022	141-154	11	59
4	4	1078	15023-15036	155-168	12	59
5	5	1079	15037-15050	169-182	13	59
6	6	1080	15051-15063	183-195	14	59
7	7	1081	15064-15077	196-209	15	59
8	8	1082	15078-15091	210-223	16	59
9	9	1083	15092-15105	224-237	17	59
10	10	1084	15106-15119	238-251	18	59
11	11	1085	15120-15133	1- 14	1	60
12	12	1086	15134-15147	15- 28	2	60
13	13	1087	15148-15161	29- 42	3	60
14	14	1088	15162-15175	43- 56	4	60
15	15	1089	15176-15189	57- 70	5	60
16	16	1090	15190-15203	71- 84	6	60
17	17	1091	15204-15217	85- 98	7	60
18	18	1092	15218-15231	99-112	8	60
19	19	1093	15232-15245	113-126	9	60
20	20	1094	15246-15259	127-140	10	60
21	21	1095	15260-15273	141-154	11	60
22	22	1096	15274-15287	155-168	12	60
23	23	1097	15288-15301	169-182	13	60
24	24	1098	15302-15314	183-195	14	60
25	25	1099	15315-15328	196-209	15	60
26	26	1100	15329-15342	210-223	16	60
27	27	1101	15343-15356	224-237	17	60
28	28	1102	15357-15370	238-251	18	60
29	29	1103	15371-15384	1- 14	1	61
30	30	1104	15385-15398	15- 28	2	61
31	31	1105	15399-15412	29- 42	3	61

Landsat-2
February 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	32	1106	15413-15426	43- 56	4	61
2	33	1107	15427-15440	57- 70	5	61
3	34	1108	15441-15454	71- 84	6	61
4	35	1109	15455-15468	85- 98	7	61
5	36	1110	15469-15482	99-112	8	61
6	37	1111	15483-15496	113-126	9	61
7	38	1112	15507-15510	127-140	10	61
8	39	1113	15521-15524	141-154	11	61
9	40	1114	15535-15548	155-168	12	61
10	41	1115	15549-15552	169-182	13	61
11	42	1116	15563-15565	183-195	14	61
12	43	1117	15576-15579	196-209	15	61
13	44	1118	15580-15593	210-223	16	61
14	45	1119	15604-15607	224-237	17	61
15	46	1120	15618-15621	238-251	18	61
16	47	1121	15622-15635	1- 14	1	62
17	48	1122	15636-15649	15- 28	2	62
18	49	1123	15650-15663	29- 42	3	62
19	50	1124	15664-15677	43- 56	4	62
20	51	1125	15678-15691	57- 70	5	62
21	52	1126	15692-15705	71- 84	6	62
22	53	1127	15706-15719	85- 98	7	62
23	54	1128	15720-15733	99-112	8	62
24	55	1129	15734-15747	113-126	9	62
25	56	1130	15748-15761	127-140	10	62
26	57	1131	15762-15775	141-154	11	62
27	58	1132	15776-15789	155-168	12	62
28	59	1133	15790-15803	169-182	13	62

Landsat-2
March 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	60	1134	15804-15816	183-195	14	62
2	61	1135	15817-15830	196-209	15	62
3	62	1136	15831-15844	210-223	16	62
4	63	1137	15845-15858	224-237	17	62
5	64	1138	15859-15872	238-251	18	62
6	65	1139	15873-15886	1- 14	1	63
7	66	1140	15887-15900	15- 28	2	63
8	67	1141	15901-15914	29- 42	3	63
9	68	1142	15915-15928	43- 56	4	63
10	69	1143	15929-15942	57- 70	5	63
11	70	1144	15943-15956	71- 84	6	63
12	71	1145	15957-15970	85- 98	7	63
13	72	1146	15971-15984	99-112	8	63
14	73	1147	15985-15998	113-126	9	63
15	74	1148	15999-16012	127-140	10	63
16	75	1149	16013-16026	141-154	11	63
17	76	1150	16027-16040	155-168	12	63
18	77	1151	16041-16054	169-182	13	63
19	78	1152	16055-16067	183-195	14	63
20	79	1153	16068-16081	196-209	15	63
21	80	1154	16082-16095	210-223	16	63
22	81	1155	16096-16109	224-237	17	63
23	82	1156	16110-16123	238-251	18	63
24	83	1157	16124-16137	1- 14	1	64
25	84	1158	16138-16151	15- 28	2	64
26	85	1159	16152-16165	29- 42	3	64
27	86	1160	16166-16179	43- 56	4	64
28	87	1161	16180-16193	57- 70	5	64
29	88	1162	16194-16207	71- 84	6	64
30	89	1163	16208-16221	85- 98	7	64
31	90	1164	16222-16235	99-112	8	64

Landsat-2

April 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	91	1165	16236-16249	113-126	9	64
2	92	1166	16250-16263	127-140	10	64
3	93	1167	16264-16277	141-154	11	64
4	94	1168	16278-16291	155-168	12	64
5	95	1169	16292-16305	169-182	13	64
6	96	1170	16306-16318	183-195	14	64
7	97	1171	16319-16332	196-209	15	64
8	98	1172	16333-16346	210-223	16	64
9	99	1173	16347-16360	224-237	17	64
10	100	1174	16361-16374	238-251	18	64
11	101	1175	16375-16388	1- 14	1	65
12	102	1176	16389-16402	15- 28	2	65
13	103	1177	16403-16416	29- 42	3	65
14	104	1178	16417-16430	43- 56	4	65
15	105	1179	16431-16444	57- 70	5	65
16	106	1180	16445-16458	71- 84	6	65
17	107	1181	16459-16472	85- 98	7	65
18	108	1182	16473-16486	99-112	8	65
19	109	1183	16487-16500	113-126	9	65
20	110	1184	16501-16514	127-140	10	65
21	111	1185	16515-16528	141-154	11	65
22	112	1186	16529-16542	155-168	12	65
23	113	1187	16543-16556	169-182	13	65
24	114	1188	16557-16569	183-195	14	65
25	115	1189	16570-16583	196-209	15	65
26	116	1190	16584-16597	210-223	16	65
27	117	1191	16598-16611	224-237	17	65
28	118	1192	16612-16625	238-251	18	65
29	119	1193	16626-16639	1- 14	1	66
30	120	1194	16640-16653	15- 28	2	66

C-2

Landsat-2

May 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	121	1195	16654-16667	29- 42	3	66
2	122	1196	16668-16681	43- 56	4	66
3	123	1197	16682-16695	57- 70	5	66
4	124	1198	16696-16709	71- 84	6	66
5	125	1199	16710-16723	85- 98	7	66
6	126	1200	16724-16737	99-112	8	66
7	127	1201	16738-16751	113-126	9	66
8	128	1202	16752-16765	127-140	10	66
9	129	1203	16766-16779	141-154	11	66
10	130	1204	16780-16793	155-168	12	66
11	131	1205	16794-16807	169-182	13	66
12	132	1206	16808-16820	183-195	14	66
13	133	1207	16821-16834	196-209	15	66
14	134	1208	16835-16848	210-223	16	66
15	135	1209	16849-16862	224-237	17	66
16	136	1210	16863-16876	238-251	18	66
17	137	1211	16877-16890	1- 14	1	67
18	138	1212	16891-16904	15- 28	2	67
19	139	1213	16905-16918	29- 42	3	67
20	140	1214	16919-16932	43- 56	4	67
21	141	1215	16933-16946	57- 70	5	67
22	142	1216	16947-16960	71- 84	6	67
23	143	1217	16961-16974	85- 98	7	67
24	144	1218	16975-16988	99-112	8	67
25	145	1219	16989-17002	113-126	9	67
26	146	1220	17003-17016	127-140	10	67
27	147	1221	17017-17030	141-154	11	67
28	148	1222	17031-17044	155-168	12	67
29	149	1223	17045-17058	169-182	13	67
30	150	1224	17059-17071	183-195	14	67
31	151	1225	17072-17085	196-209	15	67

Landsat-2

June 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	152	1226	17086-17099	210-223	16	67
2	153	1227	17100-17113	224-237	17	67
3	154	1228	17114-17127	238-351	18	67
4	155	1229	17128-17141	1- 14	1	68
5	156	1230	17142-17155	15- 28	2	68
6	157	1231	17156-17169	29- 42	3	68
7	158	1232	17170-17183	43- 56	4	68
8	159	1233	17184-17197	57- 70	5	68
9	160	1234	17198-17211	71- 84	6	68
10	161	1235	17212-17225	85- 98	7	68
11	162	1236	17226-17239	99-112	8	68
12	163	1237	17240-17253	113-126	9	68
13	164	1238	17254-17267	127-140	10	68
14	165	1239	17268-17281	141-154	11	68
15	166	1240	17282-17295	155-168	12	68
16	167	1241	17296-17309	169-182	13	68
17	168	1242	17310-17322	183-195	14	68
18	169	1243	17323-17336	196-209	15	68
19	170	1244	17337-17350	210-223	16	68
20	171	1245	17351-17364	224-237	17	68
21	172	1246	17365-17378	238-251	18	68
22	173	1247	17379-17392	1- 14	1	69
23	174	1248	17393-17406	15- 28	2	69
24	175	1249	17407-17420	29- 42	3	69
25	176	1250	17421-17434	43- 56	4	69
26	177	1251	17435-17448	57- 70	5	69
27	178	1252	17449-17462	71- 84	6	69
28	179	1253	17463-17476	85- 98	7	69
29	180	1254	17477-17490	99-112	8	69
30	181	1255	17491-17504	113-126	9	69

Landsat-2

July 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	182	1256	17505-17518	127-140	10	69
2	183	1257	17519-17532	141-154	11	69
3	184	1258	17533-17546	155-168	12	69
4	185	1259	17547-17560	169-182	13	69
5	186	1260	17561-17563	183-195	14	69
6	187	1261	17564-17587	196-209	15	69
7	188	1262	17588-17601	210-223	16	69
8	189	1263	17602-17615	224-237	17	69
9	190	1264	17616-17629	238-251	18	69
10	191	1265	17630-17643	1- 14	1	70
11	192	1266	17644-17657	15- 28	2	70
12	193	1267	17658-17671	29- 42	3	70
13	194	1268	17672-17685	43- 56	4	70
14	195	1269	17686-17699	57- 70	5	70
15	196	1270	17700-17713	71- 84	6	70
16	197	1271	17714-17727	85- 98	7	70
17	198	1272	17728-17741	99-112	8	70
18	199	1273	17742-17755	113-126	9	70
19	200	1274	17756-17769	127-140	10	70
20	201	1275	17770-17783	141-154	11	70
21	202	1276	17784-17797	155-168	12	70
22	203	1277	17798-17811	169-182	13	70
23	204	1278	17812-17824	183-195	14	70
24	205	1279	17825-17838	196-209	15	70
25	206	1280	17839-17852	210-223	16	70
26	207	1281	17853-17866	224-237	17	70
27	208	1282	17867-17880	238-251	18	70
28	209	1283	17881-17894	1- 14	1	71
29	210	1284	17895-17908	15- 28	2	71
30	211	1285	17909-17922	29- 42	3	71
31	212	1286	17923-17936	43- 56	4	71

Landsat-2
August 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	213	1287	17937-17950	57- 70	5	71
2	214	1288	17951-17964	71- 84	6	71
3	215	1289	17965-17978	85- 98	7	71
4	216	1290	17979-17992	99-112	8	71
5	217	1291	17993-18006	113-126	9	71
6	218	1292	18007-18020	127-140	10	71
7	219	1293	18021-18034	141-154	11	71
8	220	1294	18035-18048	155-168	12	71
9	221	1295	18049-18062	169-182	13	71
10	222	1296	18063-18075	183-195	14	71
11	223	1297	18076-18089	196-209	15	71
12	224	1298	18090-18103	210-223	16	71
13	225	1299	18104-18117	224-237	17	71
14	226	1300	18118-18131	238-251	18	71
15	227	1301	18132-18145	1- 14	1	72
16	228	1302	18146-18159	15- 28	2	72
17	229	1303	18160-18173	29- 42	3	72
18	230	1304	18174-18187	43- 56	4	72
19	231	1305	18188-18201	57- 70	5	72
20	232	1306	18202-18215	71- 84	6	72
21	233	1307	18216-18229	85- 98	7	72
22	234	1308	18230-18243	99-112	8	72
23	235	1309	18244-18257	113-126	9	72
24	236	1310	18258-18271	127-140	10	72
25	237	1311	18272-18285	141-154	11	72
26	238	1312	18286-18299	155-168	12	72
27	239	1313	18300-18313	169-182	13	72
28	240	1314	18314-18326	183-195	14	72
29	241	1315	18327-18340	196-209	15	72
30	242	1316	18341-18354	210-223	16	72
31	243	1317	18355-18368	224-237	17	72

Landsat-2
September 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	244	1318	18369-18382	238-251	18	72
2	245	1319	18383-18396	1- 14	1	73
3	246	1320	18397-18410	15- 28	2	73
4	247	1321	18411-18424	29- 42	3	73
5	248	1322	18425-18438	43- 56	4	73
6	249	1323	18438-18452	57- 70	5	73
7	250	1324	18453-18466	71- 84	6	73
8	251	1325	18467-18480	85- 98	7	73
9	252	1326	18481-18494	99-112	8	73
10	253	1327	18495-18508	113-126	9	73
11	254	1328	18509-18522	127-140	10	73
12	255	1329	18523-18536	141-154	11	73
13	256	1330	18537-18550	155-168	12	73
14	257	1331	18551-18564	169-182	13	73
15	258	1332	18565-18577	183-195	14	73
16	259	1333	18578-18591	196-209	15	73
17	260	1334	18592-18605	210-223	16	73
18	261	1335	18606-18619	224-237	17	73
19	262	1336	18620-18633	238-251	18	73
20	263	1337	18634-18647	1- 14	1	74
21	264	1338	18648-18661	15- 28	2	74
22	265	1339	18662-18675	29- 42	3	74
23	266	1340	18676-18689	43- 56	4	74
24	267	1341	18690-18703	57- 70	5	74
25	268	1342	18704-18717	71- 84	6	74
26	269	1343	18718-18731	85- 98	7	74
27	270	1344	18732-18745	99-112	8	74
28	271	1345	18746-18759	113-126	9	74
29	272	1346	18760-18773	127-140	10	74
30	273	1347	18774-18787	141-154	11	74

Landsat-2
October 1978

Date	GMT Day	Flight Day	Spacecraft Orbit	Cycle Orbits	Cycle Day	Cycle
1	274	1348	18788-18801	155-168	12	74
2	275	1349	18802-18815	169-182	13	74
3	276	1350	18816-18828	183-195	14	74
4	277	1351	18829-18842	196-209	15	74
5	278	1352	18843-18856	210-223	16	74
6	279	1353	18857-18870	224-237	17	74
7	280	1354	18871-18884	238-251	18	74
8	281	1355	18885-18898	1- 14	1	75
9	282	1356	18899-18912	15- 28	2	75
10	283	1357	18913-18926	29- 42	3	75
11	284	1358	18927-18940	43- 56	4	75
12	285	1359	18941-18954	57- 70	5	75
13	286	1360	18955-18968	71- 84	6	75
14	287	1361	18969-18982	85- 98	7	75
15	288	1362	18983-18996	99-112	8	75
16	289	1363	18997-19010	113-126	9	75
17	290	1364	19011-19024	127-140	10	75
18	291	1365	19025-19038	141-154	11	75
19	292	1366	19039-19052	155-168	12	75
20	293	1367	19053-19066	169-182	13	75
21	294	1368	19067-19079	183-195	14	75
22	295	1369	19080-19093	196-209	15	75
23	296	1370	19094-19107	210-223	16	75
24	297	1371	19108-19121	224-237	17	75
25	298	1372	19122-19135	238-251	18	75
26	299	1373	19136-19149	1- 14	1	76
27	300	1374	19150-19163	15- 28	2	76
28	301	1375	19164-19177	29- 42	3	76
29	302	1376	19178-19191	43- 56	4	76
30	303	1377	19142-19205	57- 70	5	76
31	304	1378	19206-19219	71- 84	6	76

Landsat-2
November 1978

Date	GMT Day	Flight Day	Spacecraft Orbit	Cycle Orbits	Cycle Day	Cycle
1	305	1379	19220-19233	85- 98	7	76
2	306	1380	19234-19247	99-112	8	76
3	307	1381	19248-19261	113-126	9	76
4	308	1382	19262-19275	127-140	10	76
5	309	1383	19276-19289	141-154	11	76
6	310	1384	19290-19303	155-168	12	76
7	311	1385	19304-19317	169-182	13	76
8	312	1386	19318-19330	183-195	14	76
9	313	1387	19331-19344	196-209	15	76
10	314	1388	19345-19358	210-223	16	76
11	315	1389	19359-19372	224-237	17	76
12	316	1390	19373-19386	238-251	18	76
13	317	1391	19387-19400	1- 14	1	77
14	318	1392	19401-19414	15- 28	2	77
15	319	1393	19415-19428	29- 42	3	77
16	320	1394	19429-19442	43- 56	4	77
17	321	1395	19443-19456	57- 70	5	77
18	322	1396	19457-19470	71- 84	6	77
19	323	1397	19471-19484	85- 98	7	77
20	324	1398	19485-19498	99- 112	8	77
21	325	1399	19499-19512	113-126	9	77
22	326	1400	19513-19526	127-140	10	77
23	327	1401	19527-19540	141-154	11	77
24	328	1402	19541-19554	155-168	12	77
25	329	1403	19555-19568	169-182	13	77
26	330	1404	19569-19581	183-195	14	77
27	331	1405	19582-19595	196-209	15	77
28	332	1406	19596-19609	210-223	16	77
29	333	1407	19610-19623	224-237	17	77
30	334	1408	19624-19637	238-251	18	77

Landsat-2
December 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	335	1409	19638-19651	1- 14	1	78
2	336	1410	19652-19665	15- 28	2	78
3	337	1411	19666-19679	29- 42	3	78
4	338	1412	19680-19693	43- 56	4	78
5	339	1413	19694-19707	57- 70	5	78
6	340	1414	19708-19721	71- 84	6	78
7	341	1415	19722-19735	85- 98	7	78
8	342	1416	19736-19749	99-112	8	78
9	343	1417	19750-19763	113-126	9	78
10	344	1418	19764-19777	127-140	10	78
11	345	1419	19778-19791	141-154	11	78
12	346	1420	19792-19805	155-168	12	78
13	347	1421	19806-19819	169-182	13	78
14	348	1422	19820-19832	183-195	14	78
15	349	1423	19833-19846	196-209	15	78
16	350	1424	19847-19860	210-223	16	78
17	351	1425	19861-19874	224-237	17	78
18	352	1426	19875-19888	238-251	18	78
19	353	1427	19889-19902	1- 14	1	79
20	354	1428	19903-19916	15- 28	2	79
21	355	1429	19917-19930	29- 42	3	79
22	356	1430	19931-19944	43- 56	4	79
23	357	1431	19945-19958	57- 70	5	79
24	358	1432	19959-19972	71- 84	6	79
25	359	1433	19973-19986	85- 98	7	79
26	360	1434	19987-20000	99-112	8	79
27	361	1435	20001-20014	113-126	9	79
28	362	1436	20015-20028	127-140	10	79
29	363	1437	20029-20042	141-154	11	79
30	364	1438	20043-20056	155-168	12	79
31	365	1439	20057-20070	169-182	13	79

APPENDIX C

LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

APPENDIX C
LANDSAT-2 DOCUMENTS ISSUED THIS REPORT PERIOD

<u>No.</u>	<u>Document No.</u>	<u>Title and Date</u>
1	14N5-L/2-21	Playback Overspeed of WBVTR-2 of Landsat-2, dated 28 June 1978.

LANDSAT-3

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INTRODUCTION

This is the 3rd report in a continuing series of documents issued at launch, and quarterly thereafter, to present flight performance analyses of the Landsat-3 spacecraft. The previously issued document is:

<u>Document No.</u>	<u>Title</u>	<u>Date</u>
78SDS4203	Landsat-3 Launch and Flight Activation Evaluation Report 5 to 9 March 1978, through Orbit 50 and Orbit Adjust Operation.	17 March 1978
78SDS4216	Landsat-1, Landsat-2, and Landsat-3 Flight Evaluation Report, 23 January 1978 to 23 April 1978	3 May 1978

This report contains analysis of performance for Orbits 565 to 1956 for Landsat-3.

SECTION I
SUMMARY
LANDSAT-3 OPERATIONS

SECTION 1
SUMMARY LANDSAT-3 OPERATIONS

The Landsat-3 spacecraft was launched from the Western Test Range on 5 March 1978 at 064:17:54:00.551 GMT. The launch and orbital injection phase of the spacecraft were nominal and deployment of the spacecraft followed predictions.

All systems performed normally until Orbit 41, 8 March 1978, when cell 4 of the "B" COMSTOR would not load and verify properly. Subsequent orbits would not verify and dummy commands "000" were used in cell 4 until 18 Marcy 1978, when cell 4 changed to all "1's". The "B" COMSTOR was then taken out of operational use until Orbit 1897 (19 July 1978) when it was activated for processing spacecraft commands.

The ECAM halted on 4 May 1978 due to a fixed core checksum error. It again halted on 31 May 1978 when core location 0403 (octal) contained a discrepancy. Neither error affects spacecraft operation. The on-board checksum value for ECAM has been changed to accommodate the core errors and ECAM operation has been normal since then.

The RBV Camera 1 had intermittent white level saturation during a RBV image which was first detected in Orbit 55, 9 March 1978. It is more prevalent in the first 5% of occasional images. Operational use of the RBV was not interrupted.

Bands 1 through 4 MSS operate nominally. Band 5 slowly improved its gas molecule contamination until the first turn ON after the 7th outgas cycle on 11 July 1978. Sensor 26 was nominal, but no output was visible from sensor 25. After tests in subsequent orbits confirmed this anomaly, Band 5 was turned OFF for study.

The spacecraft continues to perform its mission satisfactorily with four bands of the MSS, the RBV, and both Wideband Telemetry Systems in use. Table 1-1 shows cumulative in-orbit payload system performance.

Table 1-1. In-Orbit Payload Systems Performance Launch thru Orbit 1893
(7/19/78), Landsat-3

RBV	Total Scenes Imaged	5661
	Total Area Imaged (million sq. n mi.	49.4
	ON TIME (hr.)	56.6
	ON/OFF Cycles	652
	% Real Time Images	89
	% Recorded Images	11
MSS	Total Scenes Imaged	22,906
	Total Area Imaged (million sq. n mi.	199.9
	ON TIME (hr.)	276.1
	ON/OFF Cycles	2058
	% Real Time Images	80
	% Recorded Images	20
DCS	Messages at OCC	148,819
	Users	48.
	ON TIME (hr.)	3249.4
WPA-1	ON TIME (hr.)	61.0
	ON/OFF Cycles	438
WPA-2	ON TIME (hr.)	224.9
	ON/OFF Cycles	1268
WBVTR-1	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	Time Head-Tape Contact (hr.)	13.1
	Cycles Head-Tape Contact	283
	ON TIME (hr.)	16.6
WBVTR-2	% Record Mode	38
	% Playback Mode	41
	% Rewind Mode	20
	% Standby Mode	1
	MFSE Count in P/B	<5
	Time Head-Tape Contact (hr.)	86.3
	Cycles Head-Tape Contact	1508
	ON TIME (hr.)	109.1

SECTION 2
ORBITAL PARAMETERS
LANDSAT-3

SECTION 2

ORBITAL PARAMETERS

A short lived ground track control program using Pitch Position Bias (PPB) was implemented from Orbit 1028 (18 May 1978) to Orbit 1801 (12 July 1978).

Cyclically high solar activity increased spacecraft drag. An excessive number of minus Pitch gates per day were required to counter this affect and simultaneously maintain ground track drift control.

Since freon conservation is imperative to spacecraft longevity, the ground track control program was discontinued. PPB will still be used to minimize pitch flywheel speed and prevent pitch gating. In the future, the OAS system will be the prime mechanism for maintaining the spacecraft's orbit and controlling ground track drift.

At the close of this report, Landsat-3's ground track error was 1.31 nm (longitude) at the equator. Error in longitude since launch as a function of time, orbit maintenance burns and the PPB program is shown in Figure 2-1.

Figure 2-2 shows a plot of Landsat-3's local mean times for descending equatorial crossings.

Phasing relationships between Landsat-2 and Landsat-3 arc shown in Figure 2-3.

Table 2-1 tabulates the Brouwer mean orbital elements from launch through 23 July 1978.

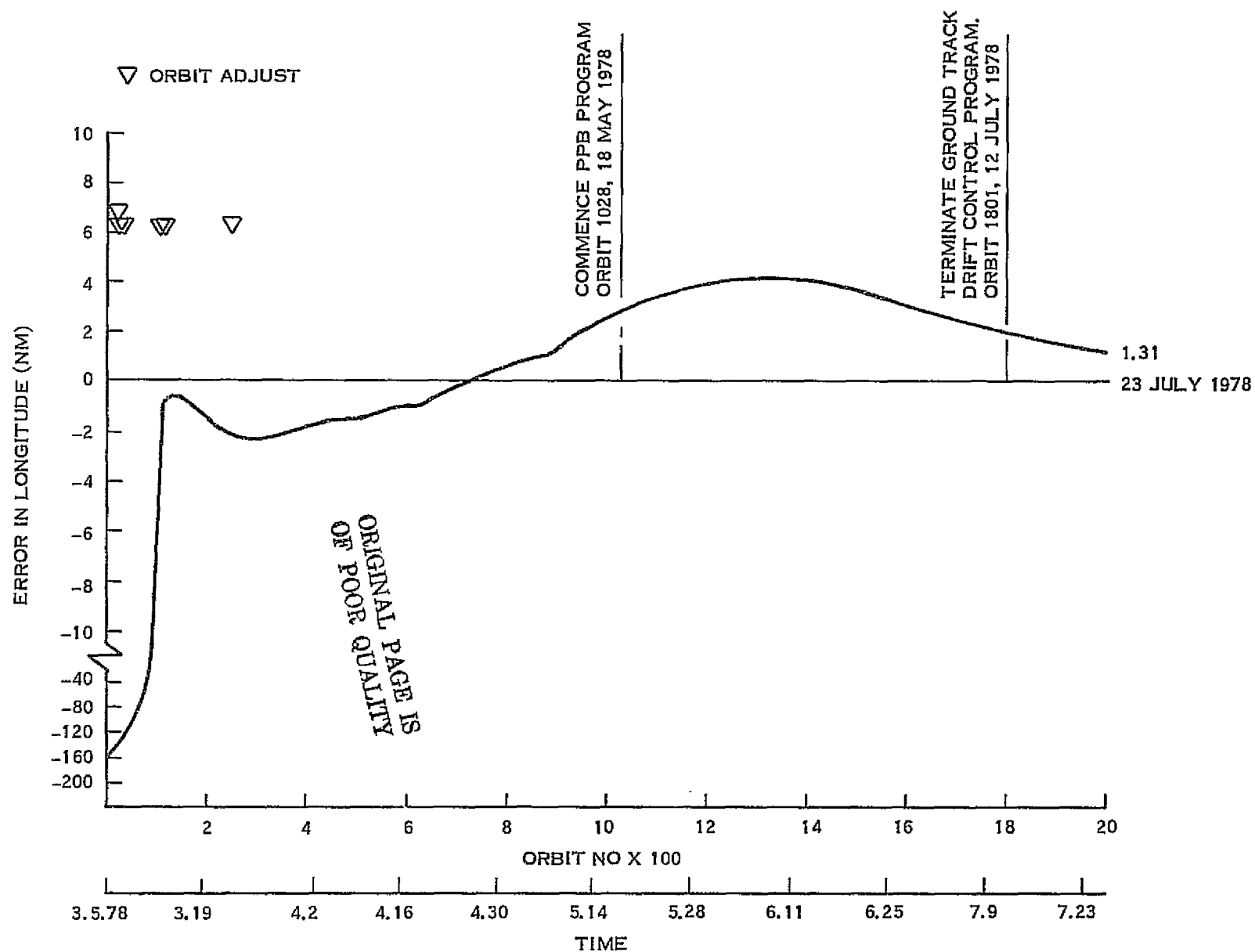
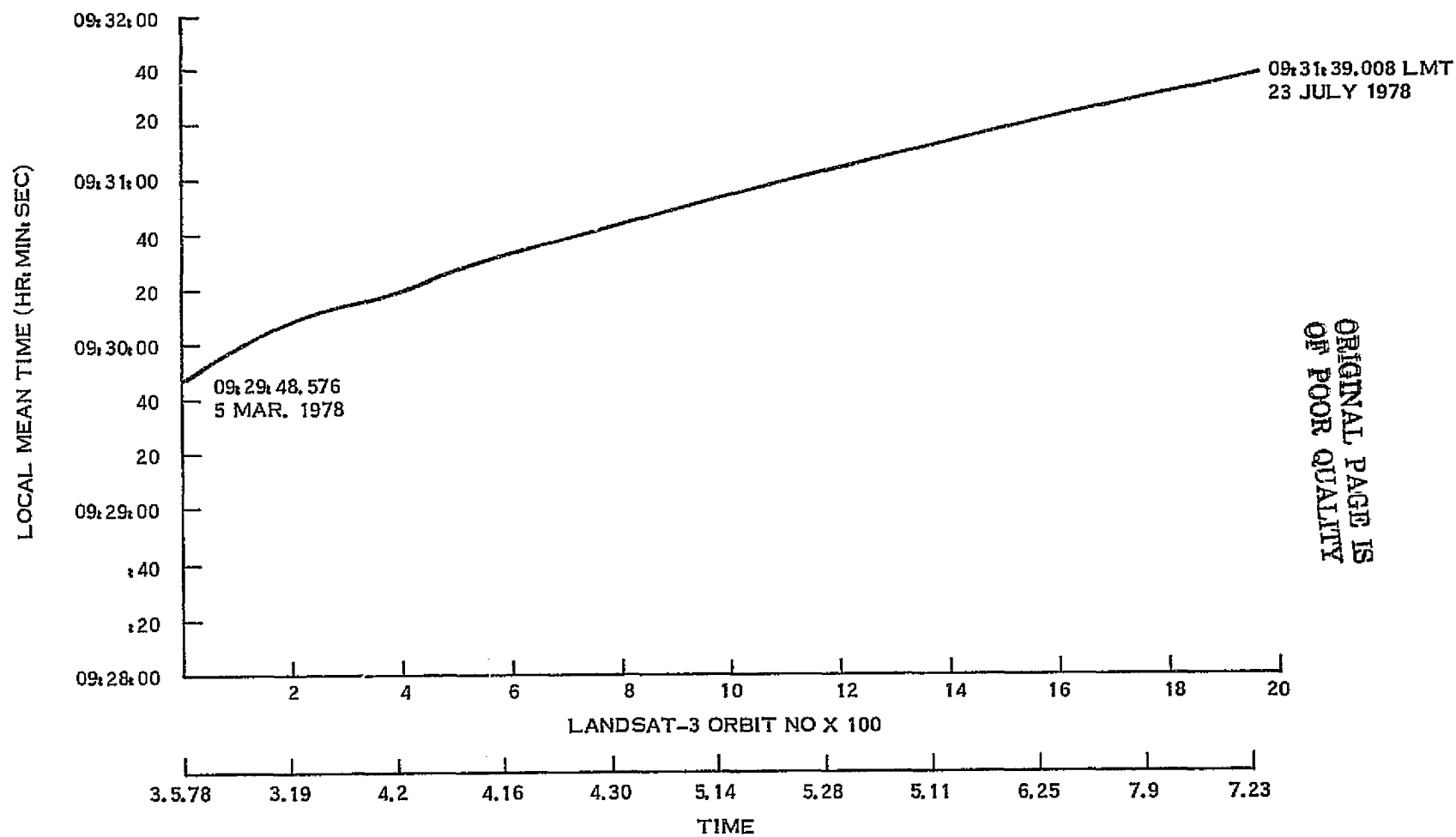


Figure 2-1. Landsat-3 Ground Track

LS-3



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2-3

Figure 2-2. Local Mean Time at Descending Node, Landsat-3

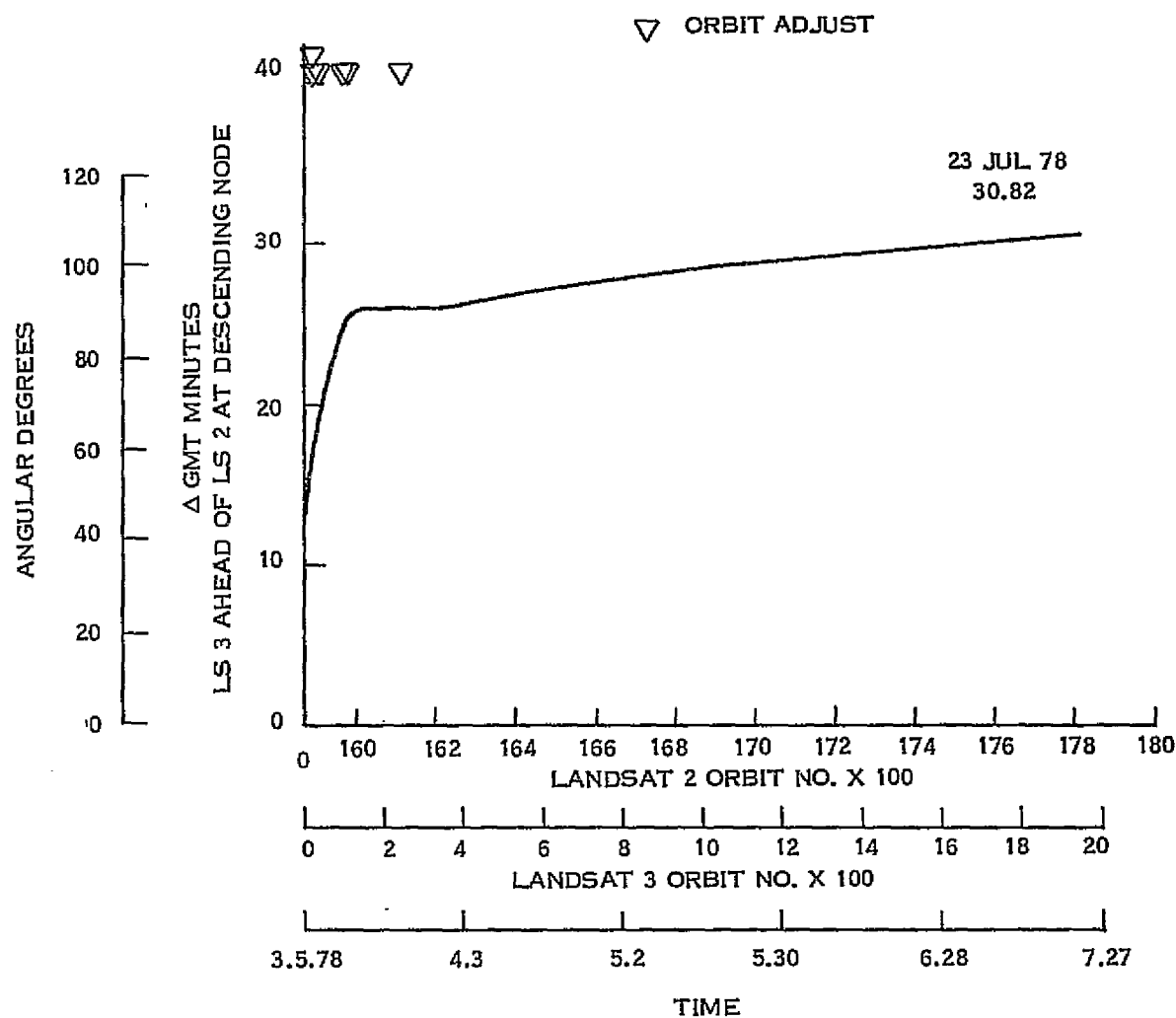


Figure 2-3. Drift in Angular Phasing Between Landsat-2 and Landsat-3

Table 2-1. Landsat-3 Brouwer Mean Orbital Parameters

Element Date	Apogee (KM)	Perigee (KM)	Inclination (Deg.)	Semi-Major Axis (KM)	Eccentricity	Anomolistic Period (Min)	Nodal Period (Min)	Argument of Perigee (Deg)	Right Ascension (Deg)	Mean Anomaly (Deg)
Nominal	915.99	899.67	99.1487	7285.9970	0.001120	103.15516	103.269	302.5609	125.6747	98.1039
5 Mar 1978 ¹	913.96	897.30	99.1348	7283.7988	0.001143	103.10848	103.2	306.5555	125.6244	94.3356
14 Mar 1978 ²	916.67	898.83	99.1249	7285.9149	0.001225	103.15341	103.26	258.6162	133.8339	281.4021
20 Apr 1978	917.37	897.84	99.1213	7285.7685	0.001340	103.15031	103.266	154.0432	171.2200	25.7708
23 July 1978	916.56	898.66	99.1116	7285.7740	0.001228	103.15042	103.266	261.2939	263.2883	213.2205

1. Post Launch.

2. After the sequence of phasing maneuvers completed in Orbit 115.

SECTION 3
POWER SUBSYSTEM (PWR)
LANDSAT-3

SECTION 3

POWER SUBSYSTEM (PWR)

The Power Subsystem on Landsat-3 has performed satisfactorily throughout this report period.

The solar arrays continued to provide excess energy above spacecraft and payload requirements and are expected to support the Landsat-3 mission through 1978. The percentage degradation of the arrays is plotted as a function of days in orbit in Figure 3-1, along with the pre-launch predicted array degradation. The array degradation at the end of 5 months in orbit was 4.34%. The projected values of midday array current are plotted in Figure 3-2. Here the array current is adjusted for sun intensity and array degradation, as well as sun angle. Along with the same curve is plotted the actual telemetry values observed until the end of the current report period. Because of the degradation of the solar array, the actual array current plot was lower than the predicted array current plot.

The battery packs on-line ranged from 8.5 to 9.03% depth of discharge (DOD) during this report period. Battery voltages have been maintained within suitable limits with Landsat-3 power management procedure, excess array energy being dissipated through auxiliary loads. Temperatures ranged from 15.27 to 20.45°C during this report period.

The power subsystem electronics have performed well during this report period with all regulated voltages stable. Table 3-1 shows major subsystem parameters and Table 3-2 shows power subsystem telemetry for selected orbits. Some parameters in Table 3-1 may be slightly different from those in Table 3-2 because Table 3-1 uses a power management time span (night followed by day), whereas the time span used in Table 3-2 is the playback period from the NBR.

Figure 3-3 shows the predicted variation in sun angle to orbit plane and solar panels for Landsat-3.

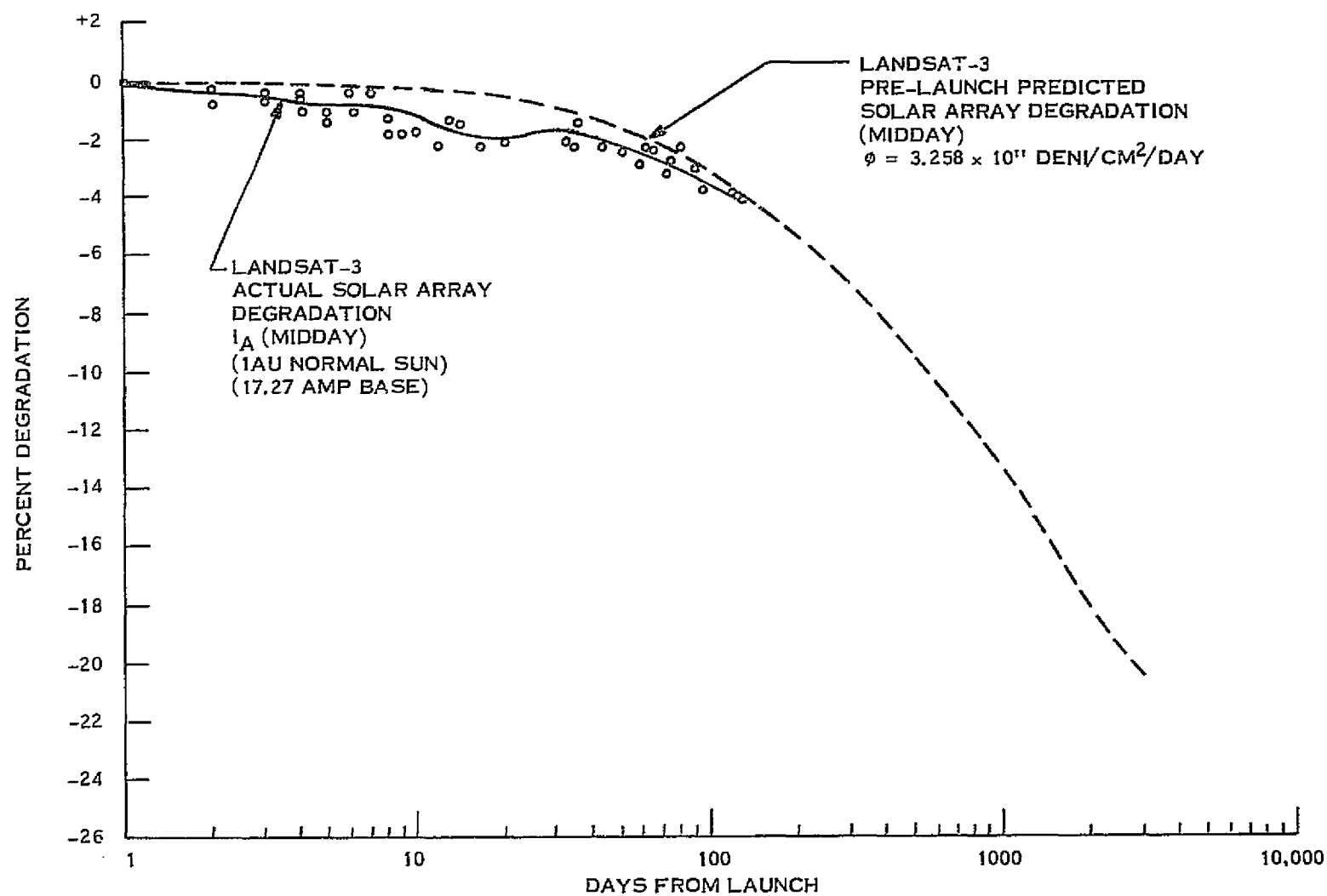


Figure 3-1. Landsat-3 I_A (Midday) Degradation vs Days

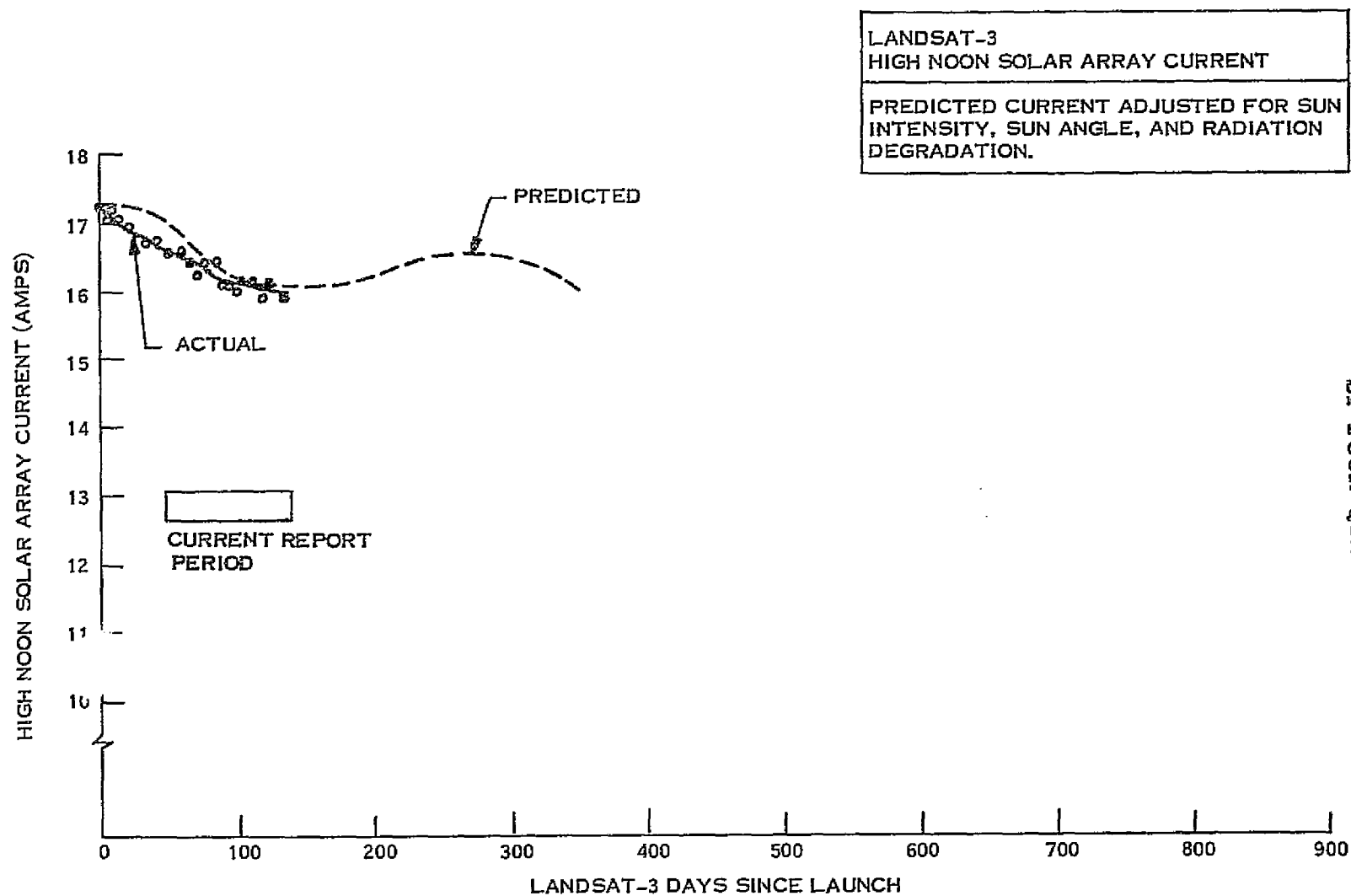
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Figure 3-2. Landsat-3 Midday Solar Array Current

Table 3-1. Landsat-3 Major Power Subsystem Parameters

Pwr. Mgmt. Orbit No.	Orbit					
	56	140	540	982	1404	1840
Batt 1 Max	-32.41	-32.58	-31.39	33.09	32.92	32.83
2 Chge	-32.41	-32.58	-31.30	33.09	32.83	32.83
3 Volt	-32.50	-32.67	-31.50	33.17	33.00	32.92
4	-32.32	-32.49	-31.30	33.00	32.83	32.75
5	-32.41	-32.75	-31.39	33.09	32.92	32.83
6	-32.41	-32.75	-31.39	33.17	32.92	32.92
7	-32.54	-32.71	-31.53	33.21	33.04	32.96
8	-32.32	-32.49	-31.30	33.09	32.84	32.75
Average	-32.41	-32.63	-31.39	33.11	32.91	32.85
Batt 1 End-of-Night	-29.60	-29.43	-28.66	29.77	29.51	29.68
2 Volt	-29.51	-29.34	-28.66	29.68	29.51	29.60
3	-29.75	-29.59	-28.84	29.92	29.67	29.84
4	-29.51	-29.34	-28.58	29.68	29.51	29.60
5	-29.60	-29.51	-28.66	29.85	29.60	29.68
6	-29.60	-29.51	-28.75	29.77	29.60	29.68
7	-29.76	-29.59	-28.92	29.93	29.68	29.84
8	-29.51	-29.34	-28.58	29.68	29.43	29.60
Average	-29.60	-29.46	-28.70	29.79	29.56	29.69
Batt 1 Chge	12.51	12.39	12.67	12.69	12.79	12.83
2 Share	11.78	11.57	12.39	12.09	12.43	12.20
3 (%)	11.64	11.73	11.97	11.95	11.90	12.18
4	12.31	12.63	11.58	12.43	12.16	12.40
5	14.25	14.09	13.38	13.49	13.17	13.24
6	12.54	12.60	13.16	12.94	12.77	12.57
7	12.84	12.99	12.20	12.56	12.40	12.52
8	12.11	12.11	12.65	11.85	12.39	12.07
Batt 1 Load	12.85	12.43	12.87	12.97	12.94	12.80
2 Share	11.94	11.57	12.17	12.23	12.28	12.08
3 (%)	11.99	11.98	12.48	12.39	12.53	12.29
4	12.06	12.72	11.91	12.19	12.33	12.37
5	13.88	13.95	13.35	13.22	12.96	13.35
6	11.97	11.87	12.46	12.38	12.34	12.34
7	12.80	13.21	12.72	12.56	12.63	12.62
8	12.51	12.26	12.04	12.06	11.99	12.16
Batt 1 Temp	15.70	13.82	15.34	15.96	16.67	16.34
2 in.	14.31	12.45	14.44	15.27	16.20	15.65
3 (°C)	15.26	14.09	15.82	16.61	17.06	16.38
4	19.46	19.00	19.65	20.39	20.33	20.22
5	19.57	18.41	18.01	17.63	17.74	17.83
6	15.49	14.35	16.01	16.81	17.16	16.67
7	20.71	19.88	19.74	19.85	19.80	19.88
8	17.55	15.85	16.88	17.04	17.88	17.61
Average	17.26	15.98	16.99	17.44	17.86	17.57
S/C Reg Bus Pwr. (W)	148.9	145.36	137.1	138.70	151.9	135.8
Comp Load Pwr. (W) (P/O S/C Reg Bus Pwr)	0.0	44.46	46.05	5.89	5.89	5.89
P/L Reg Bus Pwr. (W)	14.3	15.8	21.2	18.20	10.60	17.50
C/D Ratio	1.26	1.24	1.17	1.17	1.44	1.15
Total Charge (A-M)	253.0	226.37	218.76	247.83	274.31	265.76
Total Discharge (A-M)	200.7	215.14	187.54	212.27	190.94	230.99
Solar Array (A-M)	1252	1236.6	1206.4	1157.10	1132.0	1125.9
S. A. Peak 1 (Amp)	18.08	17.11	16.76	17.29	16.93	16.76
Sun Angle (Deg)	40.4	39.6	34.74	30.30	29.23	31.10
Max R Pad Temp (°C)	58.40	58.4	60.8	59.60	59.60	58.40
Min R Pad Temp (°C)	-38.67	-39.34	-40.67	-42.00	-42.67	-42.00
Max L Pad Temp (°C)	53.84	58.84	54.61	53.07	53.07	53.07
Min L Pad Temp (°C)	-40.71	-41.43	-44.20	-45.71	-45.43	-45.71

Table 3-2. Landsat-3 Power Subsystem Analog Telemetry
(Average Value for Data Received in NBTR Playback)

Function	Description	Unit	Orbits					
			56	140	540	982	1464	1840
6001	Batt 1 Disc 1	Amp	0.74	0.73	0.66	0.75	0.73	0.75
6002	2		0.69	0.67	0.66	0.71	0.70	0.71
6003	3		0.60	1.05	0.65	0.72	0.71	0.69
6004	4		0.73	0.75	0.64	0.71	0.70	0.72
6005	5		0.80	0.79	0.72	0.76	0.73	0.77
6006	6	Amp	0.64	0.65	0.65	0.72	0.69	0.69
6007	7		0.74	0.73	0.68	0.73	0.72	0.73
6008	8		0.72	0.73	0.65	0.70	0.68	0.71
6011	Batt 1 Chg I		0.62	0.62	0.56	0.57	0.63	0.71
6012	2		0.59	0.57	0.56	0.54	0.63	0.66
6013	3		0.62	0.62	0.53	0.53	0.59	0.66
6014	4		0.63	0.66	0.53	0.48	0.58	0.68
6015	5		0.72	0.75	0.56	0.60	0.61	0.74
6016	6		0.62	0.67	0.54	0.52	0.58	0.63
6017	7		0.66	0.70	0.45	0.54	0.59	0.63
6018	8	VDC	0.62	0.64	0.54	0.53	0.64	0.66
6021	Batt 1 Volt		31.06	31.11	30.14	31.59	31.50	31.59
6022	2		31.04	31.09	30.11	31.57	31.47	31.56
6023	3		31.18	31.23	30.28	31.70	31.60	31.70
6024	4		31.00	31.05	30.08	31.53	31.43	31.52
6025	5		31.09	31.14	30.16	31.62	31.52	31.62
6026	6		31.10	31.16	30.18	31.64	31.54	31.63
6027	7		31.24	31.29	30.33	31.76	31.66	31.75
6028	8		31.00	31.06	30.08	31.53	31.43	31.53
6031	Batt 1 Temp	DGC	15.79	13.80	15.34	15.97	16.71	16.28
6032	2		14.55	12.39	14.47	15.27	16.18	15.47
6033	3		15.33	14.01	15.79	16.66	17.07	16.29

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6022	2		31.04	31.09	30.11	31.57	31.47	31.56
6023	3		31.18	31.23	30.28	31.70	31.60	31.70
6024	4		31.00	31.05	30.08	31.53	31.43	31.52
6025	5		31.09	31.14	30.16	31.62	31.52	31.62
6026	6		31.10	31.16	30.18	31.64	31.54	31.63
6027	7		31.24	31.29	30.33	31.76	31.66	31.75
6028	8		31.00	31.06	30.08	31.53	31.43	31.53
6031	Batt 1 Temp	DGC	15.79	13.80	15.34	15.97	16.71	16.28
6032	2		14.55	12.39	14.47	15.27	16.18	15.47
6033	3		15.33	14.01	15.79	16.66	17.07	16.29
6034	4		19.47	18.98	19.70	20.45	20.36	20.13
6035	5		19.58	18.41	18.60	17.71	17.81	17.78
6036	6		15.56	14.32	16.00	16.86	17.17	16.54
6037	7		20.71	19.86	19.83	19.99	19.83	19.77
6038	8		17.63	15.80	16.90	17.05	17.87	17.59
6040	Rt. Pad Temp	DGC	28.58	28.52	26.51	20.10	24.33	30.21
6041	Rt. Pad VM	VDC	34.03	34.16	33.19	34.82	34.75	34.68
6042	Rt. Pad VN	VDC	33.83	34.01	33.24	34.86	34.80	34.75
6044	Lt. Pad Temp	DGC	23.63	23.41	20.69	14.19	18.08	24.61
6045	Lt. Pad VF	VDC	34.05	34.17	33.21	34.82	34.76	34.69
6046	Lt. Pad VG	VDC	33.65	33.78	32.82	34.42	34.36	34.29
6050	S/C UR Bus V	VDC	31.26	31.34	30.33	31.79	31.76	31.80
6051	S/C RG Bus V	VDC	24.58	24.58	24.59	24.60	24.60	24.60
6052	Aux Reg AV	VDC	23.52	23.52	23.52	23.52	23.52	23.52
6053	Aux Reg BV	VDC	23.52	23.52	23.52	23.52	23.52	23.52
6054	Solar I	Amp	16.73	16.63	16.59	16.00	15.89	15.84
6055	S/C RG Bus I	Amp	T	T	T	T	T	T
6056	S/C RG Bus I	Amp	6.08	5.90	5.60	5.66	6.20	6.34
6058	PC Mod T1	DGC	20.30	19.03	20.07	20.39	21.67	21.22
6059	PC Mod T2	DGC	18.44	17.16	18.59	19.16	19.99	19.45
6070	P/L RG Bus V	VDC	24.64	24.65	24.62	24.66	24.66	24.66
6071	P/L UR Bu V	VDC	31.27	31.35	30.35	31.80	31.76	31.81
6072	P/L RG Bus I	Amp	T	T	T	T	T	T
6073	P Aux AV	VDC	23.63	23.63	23.66	23.65	23.65	23.66
6074	P Aux BV	VDC	23.68	23.69	23.70	23.70	23.68	23.69
6075	PR Mod T1	DGC	17.36	15.44	17.30	17.81	18.61	18.31
6076	PR Mod T2	DGC	16.77	14.85	16.81	17.34	18.21	17.77
6079	Fuse Blow V	VDC	24.66	24.66	24.64	24.68	24.68	24.68
6080	Standby	Amp	0.00	0.00	0.00	0.00	0.00	0.00

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6050	S/C UR Bus V	VDC	31.26	31.34	30.33	31.79	31.76	31.80
6051	S/C RG Bus V	VDC	24.58	24.58	24.59	24.60	24.60	24.60
6052	Aux Reg AV	VDC	23.52	23.52	23.52	23.52	23.52	23.52
6053	Aux Reg BV	VDC	23.52	23.52	23.52	23.52	23.52	23.52
6054	Solar I	Amp	16.73	16.63	16.59	16.00	15.89	15.84
6055	S/C RG Bus I	Amp	T	T	T	T	T	T
6056	S/C RG Bus I	Amp	6.08	5.90	5.60	5.66	6.20	6.34
6058	PC Mod T1	DGC	20.30	19.03	20.07	20.39	21.67	21.22
6059	PC Mod T2	DGC	18.44	17.16	18.59	19.16	19.99	19.45
6070	P/L RG Bus V	VDC	24.64	24.65	24.62	24.66	24.66	24.66
6071	P/L UR Bu V	VDC	31.27	31.35	30.35	31.80	31.76	31.81
6072	P/L RG Bus I	Amp	T	T	T	T	T	T
6073	P Aux AV	VDC	23.63	23.63	23.66	23.65	23.65	23.66
6074	P Aux BV	VDC	23.68	23.69	23.70	23.70	23.68	23.69
6075	PR Mod T1	DGC	17.36	15.44	17.30	17.81	18.61	18.31
6076	PR Mod T2	DGC	16.77	14.85	16.81	17.34	18.21	17.77
6079	Fuse Blow V	VDC	24.66	24.66	24.64	24.68	24.68	24.68
6080	Shunt 1 I	Amp	0.00	0.00	0.00	0.00	0.00	0.00
6081	2		0.00	0.00	0.00	0.00	0.00	0.00
6082	3		0.00	0.00	0.00	0.00	0.00	0.00
6083	4		0.00	0.00	0.00	0.00	0.00	0.00
6084	5		0.00	0.00	0.00	0.00	0.00	0.00
6085	6		0.00	0.00	0.00	0.00	0.00	0.00
6086	7		0.00	0.00	0.00	0.00	0.00	0.00
6087	8		0.00	0.00	0.00	0.00	0.00	0.00
6100	P/L RG Bus I	Amp	0.58	0.65	0.86	0.74	0.43	0.82
Total No.	Major Frames	Frm	372	758	785	427	785	647

*Data from TV not applicable
T - Telemetry OFF

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LS-3

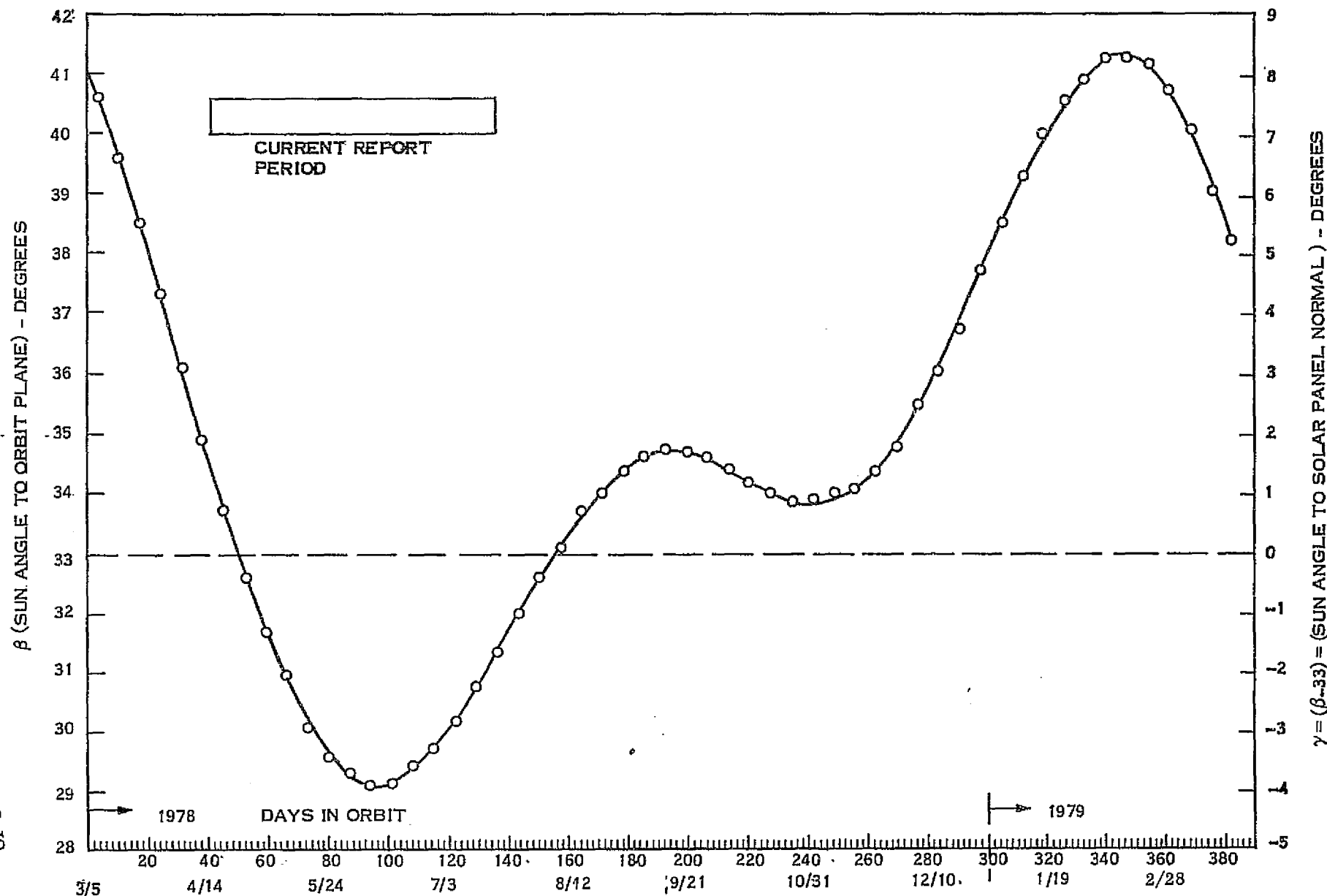


Figure 3-3. Landsat-3 Predicted Sun Angle

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SECTION 4

ATTITUDE CONTROL SUBSYSTEM (ACS)
LANDSAT-3

SECTION 4
ATTITUDE CONTROL SYSTEM (ACS)

Since launch, Landsat-3's ACS systems performance has been normal.

A ground track control program was implemented from Orbit 1028 (18 May 1978) through Orbit 1801 (12 July 1978) using Pitch Position Bias (PPB) as an Orbit Adjust (OA) substitute for controlling ground track drift.

Higher solar activity due to the sun's 11-year cycle increased spacecraft drag and a large number of Pitch gates per day were required to control the ground track. The Pitch Position Bias Arm, Disarm commands controlled pitch bias during this period.

The program was discontinued in order to conserve freon and, presently, PPB is commanded primarily to minimize Pitch flywheel speed and prevent Pitch gating. Ground track control will be maintained by the OA subsystem.

Table 4-1 shows the bias sequences implemented during the PPB program. Figures 4-1 and 4-2 summarize Landsat-3's pneumatic gating pattern since launch.

Flywheel duty cycles are low (3 to 8 percent); dual scanner mode sun transient response is normal.

Both SADS are tracking the sun and their motor voltage and tach output signatures are normal.

RMP2 is functioning normally.

RMP1 was not exercised during this report period nor has the MMCA's launch values been changed.

System's temperatures, pressures, voltages and currents have all been normal as shown in the Telemetry Summary, Tables 4-2, 4-3 and 4-4.

Table 4-1. Landsat 3 Pitch Position Bias Pneumatic Gating Summary

Period		PPB Implementation Sequence			Minutes Positioned About Satellite Ascending Node, A_N	Resulting Average Number of Pitch Gates Per Day
From Orbit	To Orbit	N_O	$N_O + 1$	$N_O + 2$		
1028 18 May 78	1515 22 Jun 78	+ 2.9	+ 2.9	+ 2.9	$(A_N - 18)$ TO $(A_N + 18)$	18 TO 20 (-P)
1515 22 June 78	1731 7 July 78	+ 2.9	+ 2.9	+ 2.9	$(T_O^* - 6)$ TO $(T_O^* + 6)$	3 TO 5 (-P)
1732 7 July 78	1801 12 July 78	+ 2.9	+ 2.9	+ 2.9	$(A_N - 18)$ TO $(A_N + 4)$	5 TO 7 (-P)
1802** 13 July 78	1956 23 July 78	+ 2.9	+ 2.9	+ 2.9	$(A_N - 13)$ TO $(A_N - 3)$	0 TO 1 (-P)

* T_O Spacecraft midnight

** This bias sequence was devised to minimize pitch gating in lieu of controlling ground tracking

Table 4-2. Landsat-3 ACS Voltages and Currents

Func	Name	Units	Orbits					
			50	140	540	991	1431	1851
1081	RMP 1 MTR Volts	VDC	F	F	F	F	F	F
1082	RMP 1 MTR Current	Amps	F	F	F	F	F	F
1080	RMP 1 Supply Volts	VDC	F	F	F	F	F	F
1091	RMP 2 MTR Volts	VDC	30.50	30.54	30.50	30.56	30.57	30.56
1092	RMP 2 MTR Current	Amps	0.11	0.11	0.11	0.11	0.11	0.11
1090	RMP 2 Supply Volts	VDC	23.66	23.65	23.64	23.65	23.65	23.65
1220	SAD RT MTR WNDNG Volts	VDC	4.64	4.41	4.21	4.14	4.05	4.06
1240	SAD LT MTR WNDNG Volts	VDC	6.30	6.32	6.62	6.69	6.50	6.66
1227	SAT RT -15 VDC Conv.	VDC	15.48	15.48	15.48	15.48	15.48	15.48
1247	SAT LT -15 VDC Conv.	VDC	14.93	14.93	14.94	14.94	14.94	14.94
1056	CLB \pm 6 VDC	TMV	2.35	2.35	2.35	2.35	2.35	2.35
1055	CLB \pm 10 VDC	TMV	2.88	2.89	2.88	2.88	2.88	2.88
1057	CLB Power Supply Volts	TMV	2.94	2.93	2.91	2.91	2.90	2.90

F = Unit OFF

Table 4-3. Landsat-3 ACS Attitude Errors and Driver Duty Cycles

Func	Name	Units	Orbits					
			051	140	540	991	1431	1851
1041	Pitch Fine Error	DEG	- 0.13	- 0.12	- 0.11	- 0.12	- 1.27*	- 0.37
1043	Pitch Flywheel Speed	RPM	-199.25	-122.83	-127.93	-104.27	311.67	209.16
1038	Pitch Mtr Drvr CCW	PCT	5.04	4.76	5.21	3.52	2.20	4.56
1039	Pitch Mtr Drvr CW	PCT	2.92	2.81	3.17	1.40	5.41	6.82
1030	Roll Fine Error	DEG	- 0.13	- 0.16	- 0.18	- 0.16	- 0.19	- 0.17
1027	Roll Rear Flywheel SPD	RPM	765.38	776.96	823.74	782.85	801.37	720.78
1026	Roll Fwd Flywheel SPD	RPM	761.61	730.50	764.20	749.99	746.75	737.02
1022	Roll Rear Mtr Drvr CCW	PCT	1.05	0.69	0.67	0.12	0.04	0.34
1025	Roll Rear Mtr Drvr CW	PCT	6.94	6.09	7.36	5.95	6.00	6.53
1023	Roll Fwd Mtr Drvr CCW	PCT	1.03	0.77	0.51	0.10	0.01	0.39
1024	Roll Fwd Mtr Drvr CW	PCT	7.49	6.23	6.91	5.48	5.30	6.46
1035	Yaw Tach	RPM	24.29	- 98.63	14.77	- 82.95	2.80	4.51
1033	Yaw Mtr Drvr CW	PCT	2.90	2.18	2.53	1.51	1.52	2.12
1034	Yaw Mtr Drvr CCW	PCT	2.72	2.59	2.20	1.69	1.42	1.78
1221	SAD Right Tach	D/M	3.22	3.15	4.02	4.01	4.06	4.01
1241	SAD Left Tach	D/M	3.75	3.78	3.77	3.77	3.76	3.76

* Pitch Position Bias Implemented in this Orbit

Table 4-4. Subsystem Temperature and Pressure Averages

Func	Name	Units	Orbits					
			50	140	540	991	1431	1851
1084	RMP 1 Gyro Temperature	DGC	18.78	20.29	21.36	22.25	22.30	22.49
1094	RMP 2 Gyro Temperature	DGC	77.52	77.55	77.55	77.93	77.99	77.99
1222	SAD RT MTR HSNQ Temp.	DGC	21.32	23.15	25.08	26.44	26.71	26.85
1242	SAD LT MTR HSNQ Temp.	DGC	26.72	28.40	29.52	30.16	30.10	30.46
1223	SAD RT MTR WNDNG Temp.	DGC	19.94	21.45	23.53	25.05	25.37	25.33
1243	SAD LT MTR WNDNG Temp	DGC	27.03	28.23	29.13	29.55	29.47	29.88
1228	SAD RT HSG Pressure	PSI	6.93	6.93	6.99	7.00	7.00	7.00
1248	SAD LT HSG Pressure	PSI	7.31	7.31	7.36	7.36	7.31	7.31
1007	FWD Scanner MTR Temp.	DGC	21.59	23.30	24.03	24.28	24.35	24.99
1016	Real Scanner MTR Temp.	DGC	22.64	23.93	24.61	25.00	24.86	25.16
1003	FWD Scanner Pressure	PSI	7.27	7.28	6.20	6.21	6.19	6.02
1012	Rear Scanner Pressure	PSI	6.93	6.99	7.06	7.12	7.14	7.14
1212	Gas Tank Pressure	PSI	1999.29	2012.44	2000.00	1999.63	1963.84	1949.63
1210	Gas Tank Temperature	DGC	19.70	21.42	22.47	23.24	23.31	23.57
1213	Manifold Pressure	PSI	59.21	58.21	59.04	59.07	59.98	59.25
1211	Manifold Temperature	DGC	19.80	21.51	22.59	23.36	23.12	23.70
1059	CLG Power Supply Card Temp	DGC	32.36	33.92	34.48	34.72	34.73	35.29
1260	THO1 EBP	DGC	23.15	24.66	25.44	25.93	25.88	26.33
1261	THO2 EBP	DGC	18.71	20.25	21.22	21.82	21.90	22.36
1262	THO3 EBP	DGC	16.64	18.32	19.78	20.76	20.93	21.17
1263	THO1 STS	DGC	- 1.25	- 0.68	- 0.31	0.09	0.14	0.72
1264	THO2 STS	DGC	- 22.92	Data Not Available				
1265	THO3 STS	DGC	5.33	6.04	5.21	4.66	4.66	6.49
1266	THO4 STS	DGC	- 11.52	- 10.59	- 9.39	- 8.22	- 7.46	- 6.29
1267	THO5 STS	DGC	6.37	6.84	6.62	6.42	6.39	7.59
1224	SAD R FSST	DGC	31.58	33.35	37.44	39.78	40.59	40.24
1244	SAD L FSST	DGC	40.97	41.56	41.53	41.44	41.54	41.88

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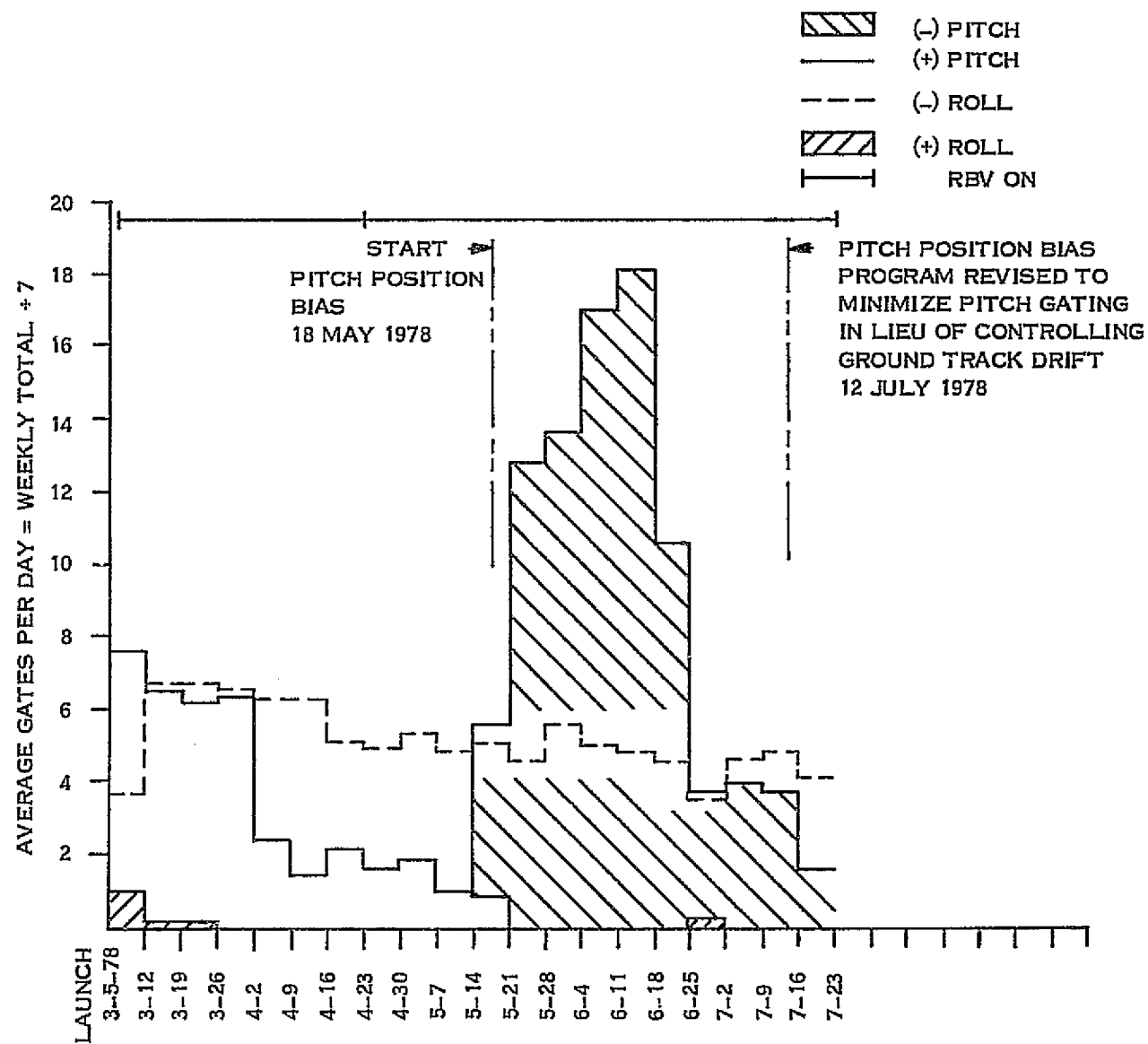


Figure 4-1. Landsat-3 Gating Frequency vs Time

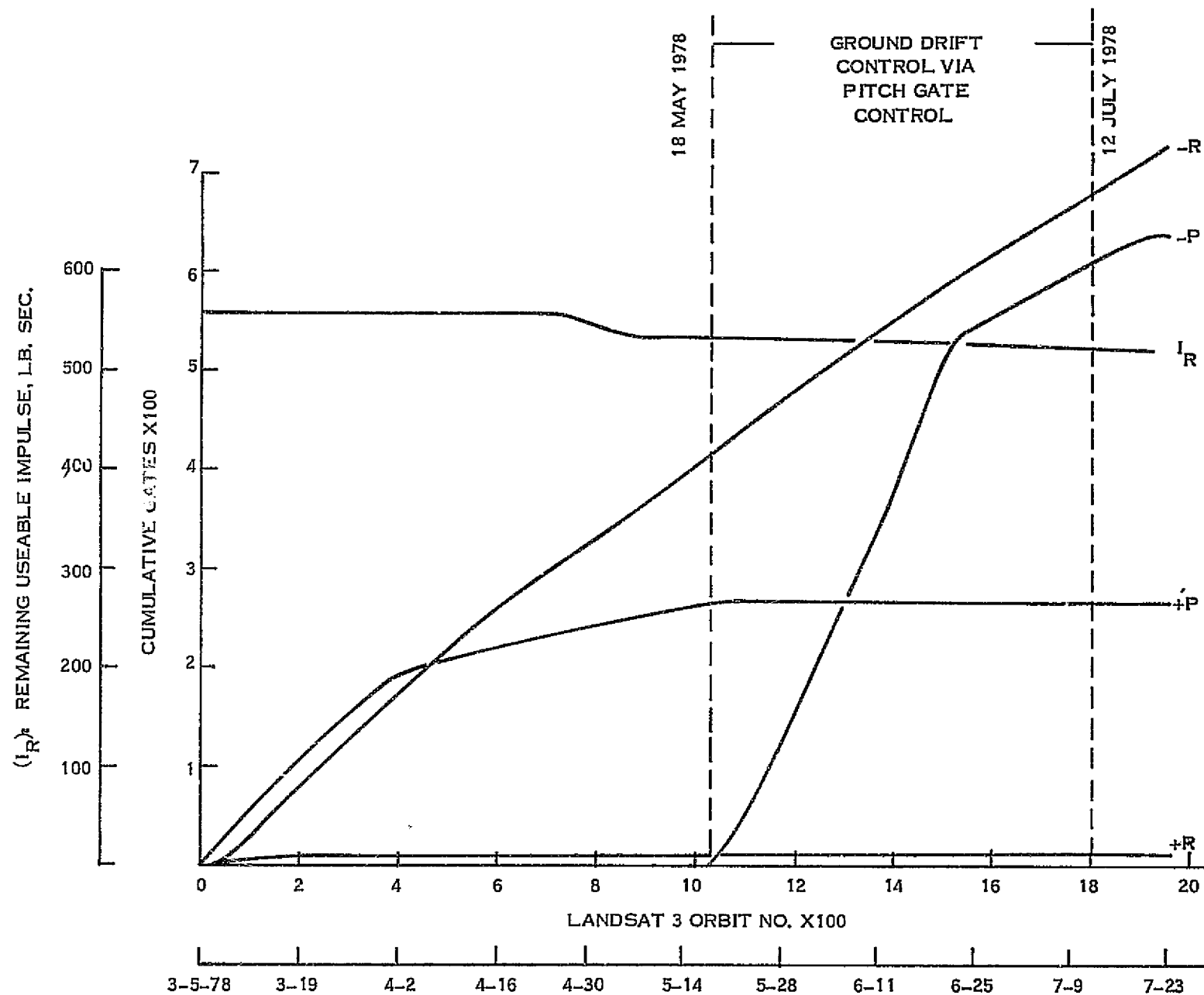


Figure 4-2. Landsat-3 Cumulative Gating History

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

LANDSAT-3

SECTION 5

COMMAND/CLOCK SUBSYSTEM (CMD)

The Command Clock Subsystem operated nominally in this report period except for Cell 4 of COMSTOR B and a minor problem with ECAM.

Cell 4 of COMSTOR B has degraded to the point that it is filled with all "1's"; non-decrementing and non-executing when a command is addressed to Cell 4. COMSTOR B was not used operationally from Orbit 48 (9 March 1978) until Orbit 1732 (7 July 1978) after which time the 14 good cells were used to execute spacecraft commands.

The ECAM performance has been satisfactory except for two checksum errors. The ECAM halted on 4 May 1978 due to a fixed core checksum error. The location causing the checksum failure was isolated to memory location 0346 (octal). The bit failure in location 0346 (octal) did not affect AOP operation. The ECAM halted again on 31 May 1978. Core location 0403 contained a discrepancy. Again, the content of core location 0403 does not affect Landsat-3 operation. The on-board checksum value for ECAM has been changed to accommodate the core errors and ECAM operation has been normal since then.

ECAM SMART routines 4 (backup of BOT or EOT switch failure for WBVTR-1) and 5 (backup of BOT or EOT switch failure for WBVTR-2) were activated on Orbit 1897 (19 July 1978).

During orbit 1507 the S/C clock was set back two seconds. Figure 5-1 shows the history of S/C clock drift since launch. Table 5-1 shows typical telemetry values since launch. All are nominal.

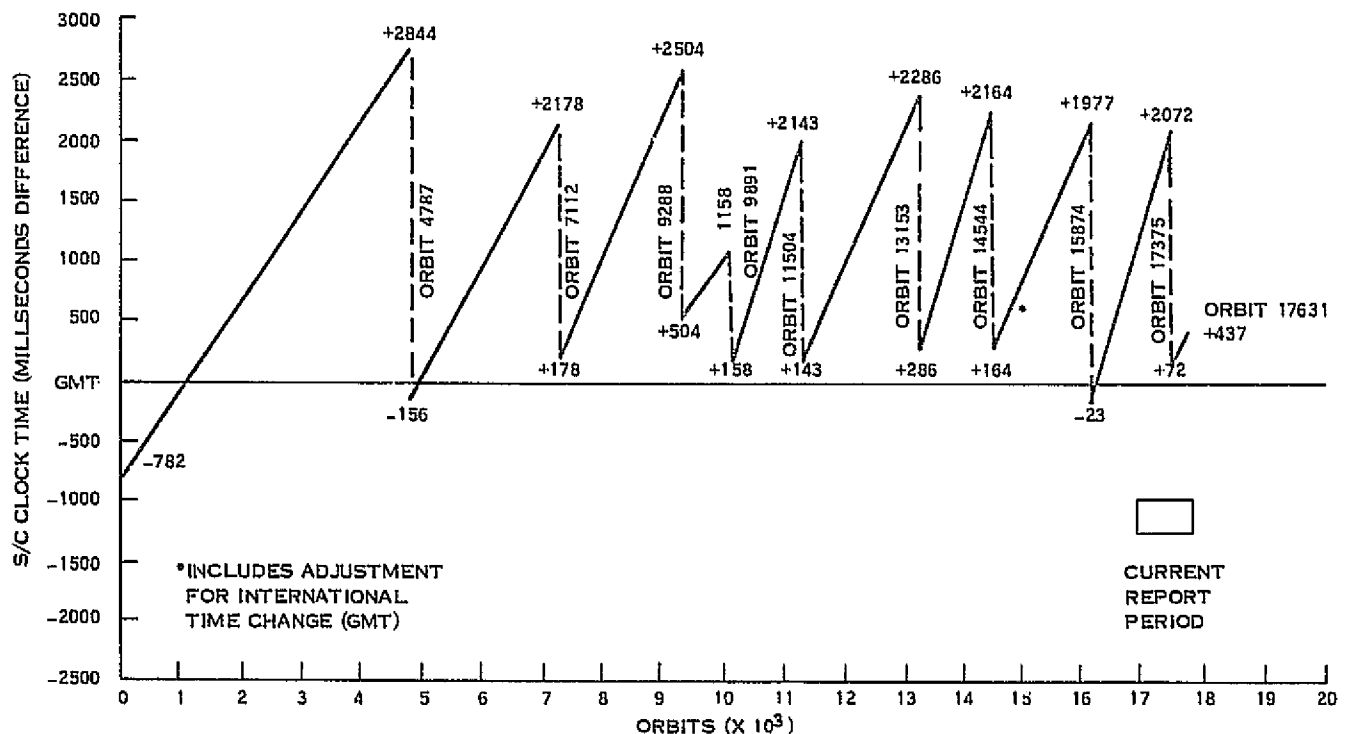


Figure 5-1. Landsat-3 Clock Drift History

Table 5-1. Command Clock Telemetry Summary

Func	Name	Units	Orbit					
			34	140	540	991	1431	1840
8005	Pri. Power Supply Temp.	DGC	41.25	40.26	41.73	42.60	42.97	42.77
8006	Red. Power Supply Temp.	DGC	41.59	40.74	42.13	42.95	43.37	43.15
8007	Pri. Osc. Temp.	DGC	30.28	28.63	29.95	30.35	30.77	30.26
8008	Red Osc. Temp.	DGC	31.21	29.42	30.70	31.21	31.61	31.04
8009	Pri. Osc. Output	TMV	1.05	1.05	1.05	1.06	1.06	1.06
8010	Red. Osc. Output	TMV	1.24	1.23	1.24	1.25	1.25	1.25
8011	100 KHz	TMV	3.13	3.13	3.12	3.13	3.13	3.13
8012	10 KHz	TMV	3.07	3.07	3.06	3.06	3.07	3.07
8013	2.5 KHz	TMV	2.95	2.95	2.95	2.95	2.95	2.95
8014	400 Hz	TMV	4.45	4.45	4.45	4.45	4.45	4.45
8015	Pri. + 4V Power Supply	VDC	2.05	2.05	2.05	2.05	2.05	2.05
8016	Red. + 4V Power Supply	VDC	1.97	1.97	1.97	1.97	1.97	1.97
8017	Pri. + 6V Power Supply	VDC	2.28	2.27	2.27	2.27	2.27	2.27
8018	Red. + 6V Power Supply	VDC	2.25	2.25	2.25	2.25	2.25	2.25
8019	Pri. - 6V Power Supply	VDC	5.25	5.25	5.25	5.25	5.25	5.25
8020	Red. - 6V Power Supply	VDC	5.23	5.23	5.23	5.23	5.23	5.23
8021	Pri. - 23V Power Supply	VDC	5.70	5.70	5.70	5.70	5.70	5.70
8022	Red. - 23V Power Supply	VDC	5.80	5.80	5.80	5.80	5.80	5.80
8023	Pri. - 29V Power Supply	VDC	5.42	5.43	5.43	5.43	5.43	5.43
8024	Red. - 29V Power Supply	VDC	5.38	5.38	5.38	5.39	5.40	5.39
8101	CIU A - 12V	VDC	3.95	3.95	3.95	3.95	3.95	3.95
8102	CIU B - 12V	VDC	3.98	3.98	3.98	3.98	3.98	3.99
8103	CIU A - 5V	VDC	4.12	4.12	4.12	4.12	4.12	4.12
8104	CIU B - 5V	VDC	4.15	4.15	4.15	4.15	4.15	4.15
8105	CIU A Temp.	DGC	22.53	21.08	21.63	21.83	22.01	21.70
8106	CIU B Temp.	DGC	20.36	19.21	19.66	19.82	19.96	19.70
8201	Receiver RF-A Temp.	DGC	28.70	26.96	27.96	28.67	28.79	28.53
8202	Receiver RF-B Temp.	DGC	21.74	19.51	20.74	21.64	21.76	21.37
8203	D MOD A Temp.	DGC	36.00	34.57	35.66	36.31	36.55	36.26
8204	D MOD B Temp.	DGC	25.27	22.74	24.37	25.18	25.50	25.09
8205	Receiver A AGC	DBM	-84.89	-85.62	-84.97	-85.36	-86.05	-87.46
8206	Receiver B AGC	DBM	F	F	F	F	F	F
8207	Amp. A Output	TMV	2.41	2.38	2.45	2.42	2.35	2.36
8208	Amp. B Output	TMV	F	F	F	F	F	F
8209	Freq. Shift Key A Out	TMV	1.09	1.08	1.08	1.08	1.08	1.08
8210	Freq. Shift Key B Out	TMV	F	F	F	F	F	F
8211	Amp. A Output	TMV	1.12	1.11	1.10	1.11	1.10	1.11
8212	Amp. B Output	TMV	F	F	F	F	F	F
8215	D MOD A - 15V	TMV	5.01	5.00	5.01	5.02	5.02	5.02
8216	D MOD B - 15V	TMV	F	F	F	F	F	F
8217	Regulator A - 10V	TMV	5.52	5.50	5.50	5.52	5.52	5.52
8218	Regulator B - 10V	TMV	F	F	F	F	F	F
8311	ECAM Memory Temp	DGC	16.18	13.18	14.50	14.88	15.43	15.15
8312	ECAM Pwr Sup Temp	DGC	19.59	14.13	15.60	16.16	16.80	16.31

F = Unit OFF

SECTION 6

TELEMETRY SUBSYSTEM (TLM)

LANDSAT-3

SECTION 6
TELEMETRY SUBSYSTEM (TLM)

The TLM Subsystem has operated nominally during this report period. Table 6-1 shows typical telemetry values since launch. All are nominal. Landsat-3 has redundant capability and "A" units have been operated since launch. Telemetry format "0" (fast verify) is in use.

Table 6-1. TMP Telemetry Values

Func	Name	Units	Orbit					
			33	540	702	991	1431	1840
09001	Power Supply A +5V	TMV	4.70	4.70	4.70	4.70	4.69	4.70
09002	Power Supply B +5V	TMV		F	F	F	F	F
09003	Power Supply A +15V	TMV	4.90	4.90	4.90	4.90	4.90	4.90
09004	Power Supply B +15V	TMV	F	F	F	F	F	F
09005	Power Supply A -6V	TMV	5.65	5.65	5.65	5.65	5.65	5.65
09006	Power Supply B -6V	TMV	F	F	F	F	F	F
09007	Power Supply A -15V	TMV	4.97	4.97	4.97	4.97	4.97	4.97
09008	Power Supply B -15V	TMV	F	F	F	F	F	F
09009	Power Supply A -22V	TMV	5.35	5.35	5.35	5.35	5.35	5.35
09010	Power Supply B -22V	TMV	F	F	F	F	F	F
09011	Power Supply A +6V	TMV	4.82	4.82	4.82	4.82	4.82	4.82
09012	Power Supply B +6V	TMV	F	F	F	F	F	F
09013	Power Supply A Temp	DGC	26.66	26.83	26.79	26.53	26.85	26.94
09014	Power Supply B Temp	DGC	25.10	23.44	23.42	23.16	23.50	23.56
09015	Temperature C	DGC	19.19	19.42	19.41	19.11	19.48	19.44
09100	Reflected Power "A"	dBm	7.61	7.80	7.87	7.84	7.79	7.80
09100	Reflected Power "B"	dBm	F	F	F	F	F	F
09101	XMTR A -20 VDC	TMV	3.87	3.90	3.90	3.90	3.90	3.90
09102	XMTR B -20 VDC	TMV	F	F	F	F	F	F
09103	XMTR A - Temp	DGC	21.01	18.40	18.00	17.78	17.73	17.95
09104	XMTR B - Temp	DGC	21.89	19.24	18.85	18.61	18.60	18.80
09105	XMTR A Power Output	dBm	28.72	28.81	28.80	28.82	28.86	28.86
09106	XMTR B Power Output	dBm	F	F	F	F	F	F

F - Unit OFF

SECTION 7

ORBIT ADJUST SUBSYSTEM (OAS)

LANDSAT-3

SECTION 7
ORBIT ADJUST SUBSYSTEM (OAS)

No orbit adjust maneuvers were conducted during this report.

Table 7-1 summarizes all of the OAS system's operations since launch.

Table 7-2 shows typical telemetry values for the OAS during quiescent period. Variations in thrust chamber temperatures shown in Table 7-2 are consistent with variations in sun intensity and sun angle.

Table 7-1. Landsat-3 Orbit Adjust Summary

Orbit Adjust No.	Orbit No.	Epoch (Burn Start Time)	Burn Axis	Burn Duration (secs)	Post-Burn Freon Status (psia)	Hydra-Zine Consumed (lbs)	Post-Burn Hz Tank P (psia)	Burn Efficiency (%)	Δa (Meters)	Δi (degrees)
1	26	7 Mar 78 14:33:11.4	+X	5.2	N	0.02	532.44	N	N	0.0
2	26	7 Mar 78 14:40:01.2	-X	5.2	2006.12	0.02	532.44	N	N	0.0
3	30	7 Mar 78 21:23:01.2	+X	420.0	2012.09	1.58	532.44	107.2	-3662.2	0.0
4	109	13 Mar 78 21:00:01.2	-X	660.0	2004.51	2.30	476.20	103.7	4932.5	0.0
5	115	13 Mar 78 23:43:09.2	-X	112.0	2016.25	0.36	424.17	108.1	804.0	0.0
6	253	22 Mar 78 21:00:01.2	+X	4.8	2012.46	0.01	419.94	109.5	- 35.7	0.0

N = Data Not Available

Table 7-2. Landsat-3 OAS Telemetry Values

Func	Name	Units	Orbit					
			140	340	540	991	1430	1851
2001	Prop. Tank Temp.	DGC	15.55	16.39	17.12	16.80	17.64	17.22
2003	Thrust Chamber No. 1 (-x) Temp.	DGC	28.15	30.15	32.03	35.02	35.34	33.97
2004	Thrust Chamber No. 2 (+x) Temp.	DGC	32.88	33.97	34.61	35.50	36.77	35.89
2005	Thrust Chamber No. 3 (-y) Temp.	DGC	50.31	47.16	43.74	37.89	36.51	38.47
2006	Line Pressure	psia	416.59	419.94	423.33	423.69	427.44	427.17

SECTION 8

MAGNETIC MOMENT COMPENSATING ASSEMBLY (MMCA)

LANDSAT-3

SECTION 8
MAGNETIC MOMENT COMPENSATION ASSEMBLY (MMCA)

The MMCA's operational mode has not been altered from its launch configuration.

Presently, no urgency exists to implement MMCA compensation. Payload operations have not generated unusual magnetic torques and controlled pneumatic gating - via scheduled momentary enable commands - has successfully unloaded spacecraft momentum.

Plans are developing to utilize the MMCA in the future as an aide in controlling normal, spacecraft ground track drift.

MMCA telemetry values are shown in Table 8-1.

Table 8-1. MMCA Telemetry Values

Func	Name	Units	ORBIT					
			4	140	540	991	1431	1851
4001	A1 Board Temp	DGC	17.66	15.60	16.91	17.23	17.52	17.29
4002	A2 Board Temp	DGC	20.31	20.69	19.48	19.90	20.23	19.98
4003	Hall Current	TMV	3.65	3.63	3.62	3.62	3.62	3.62
4004	Yaw Flux Density	TMV	.00	.03	.06	.05	.07	.07
4005	Pitch Flux Density	TMV	1.87	1.87	1.92	1.89	1.91	1.91
4006	Roll Flux Density	TMV	.28	.38	.41	.40	.41	.41

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

LANDSAT-3

SECTION 9

UNIFIED S-BAND/PREMODULATION PROCESSOR (USB/PMP)

The USB Subsystem has operated nominally in this report period.

Table 9-1 shows telemetry values since launch. All are nominal. The transmitter has maintained a steady indicated power output of about 1.6 watts since launch. Figure 9-1 shows AGC readings of Goldstone for 2 constant positions in space. The scatter of data points reflect variations in the ground station calibration and readout.

Table 9-1. Landsat-3 USB/PMP Telemetry Values

Func		Units	Orbit					
			50	132	540	1020	1521	1840
11001	USB Rcvr AGC	dBm	-101.62	-75.19	-97.17	-111.53	-93.62	-112.42
11002	USB Xmtr Pwr	W	1.65	1.65	1.62	1.65	1.65	1.65
11003	USB Rcvr Error	kHz	1.81	4.45	3.31	1.43	3.63	4.08
11004	USB Xpond Temp	DGC	24.63	23.35	22.26	22.58	22.50	22.82
11005	USB Xpond Press	PSI	17.00	16.92	16.30	16.99	16.95	16.93
11007	USB Xmtr A -15V	VDC	F	F	F	F	F	F
11008	USB Xmtr B -15V	VDC	2.35	2.35	2.35	2.35	2.36	2.36
11009	USB Range -15V	VDC	2.05	2.05	2.05	2.05	2.05	2.05
11101	PMP Pwr A Volt	VDC	F	F	F	F	F	F
11102	PMP Pwr B Volt	VDC	- 15.11	-15.09	-15.13	- 14.72	-15.10	- 15.08
11103	PMP Temp A	DGC	21.48	18.84	17.71	18.82	17.29	17.46
11104	PMP Temp B	DGC	25.96	23.56	22.16	26.42	22.18	22.55

F = Unit OFF

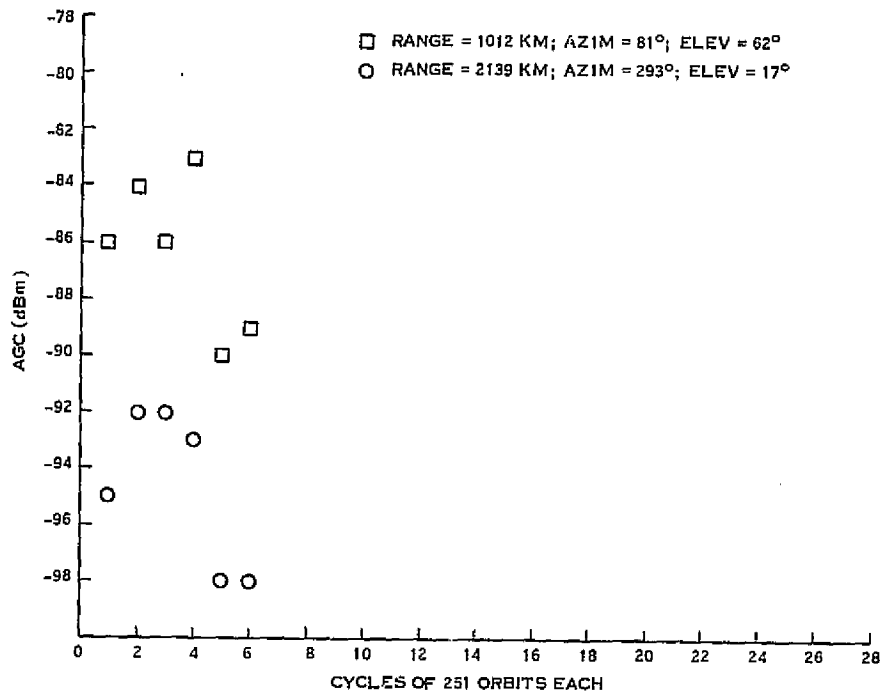


Figure 9-1. USB (Link 4) AGC Readings at Goldstone with 30-Foot Antenna, Landsat-3

SECTION 10
ELECTRICAL INTERFACE SUBSYSTEM (EIS)
LANDSAT-3

SECTION 10
ELECTRICAL INTERFACE SUBSYSTEM (EIS)
LANDSAT-3

The Auxiliary Processing Unit (APU) consisting of Search Track Data, Time Code Data, and Backup Timers operated satisfactorily throughout this report period. Telemetry for the APU is shown in Table 10-1.

Table 10-1. Landsat-3 APU Telemetry Functions

Function	Description	Unit	Orbit					
			43	140	540	982	1464	1851
13200	APU, -24.5 Vdc	TMV	2.62	2.62	2.62	2.62	2.62	2.62
13201	APU, -12 Volts	TMV	2.42	2.43	2.42	2.43	2.43	2.43
13202	APU Temp	DGC	24.43	22.71	23.10	23.13	23.24	23.51

The Power Switching Module (PSM), containing the switching relays for power to the OAS, MSS, WBVTR No. 1 and No. 2, RBV and PRM, functioned normally. During this report period, the MSS as well as WBVTR No. 2 power circuits, have been operated on a regular basis. RBV and WBVTR No. 1 power circuits have been used for limited operation.

The Interface Switching Module performed all switchings normally during this report period.

The Auxiliary Load Controller (ALC) performed all switching normally during this report period.

SECTION 11
THERMAL SUBSYSTEM (THM)
LANDSAT-3

SECTION 11
THERMAL SUBSYSTEM (THM)

The Thermal Control Subsystem in Landsat-3 has provided satisfactory control of all spacecraft equipments since launch.

Table 11-1 gives average subsystem telemetry values for several representative orbits during the 5 months of operation of Landsat-3. Average temperatures of the sensory ring bays are plotted in Figure 11-1.

During this report period the sun intensity decreased from 0.989 to 0.969 times the mean annual value. The decrease in the sun angle to the spacecraft increased the night length. As a result, the average spacecraft temperature reached a minimum during this report period.

A history of compensation load switching since launch is shown in Table 11-2. Compensation load 8 was turned on in Orbit 65 to increase the temperature of ECAM and remained on during this report period.

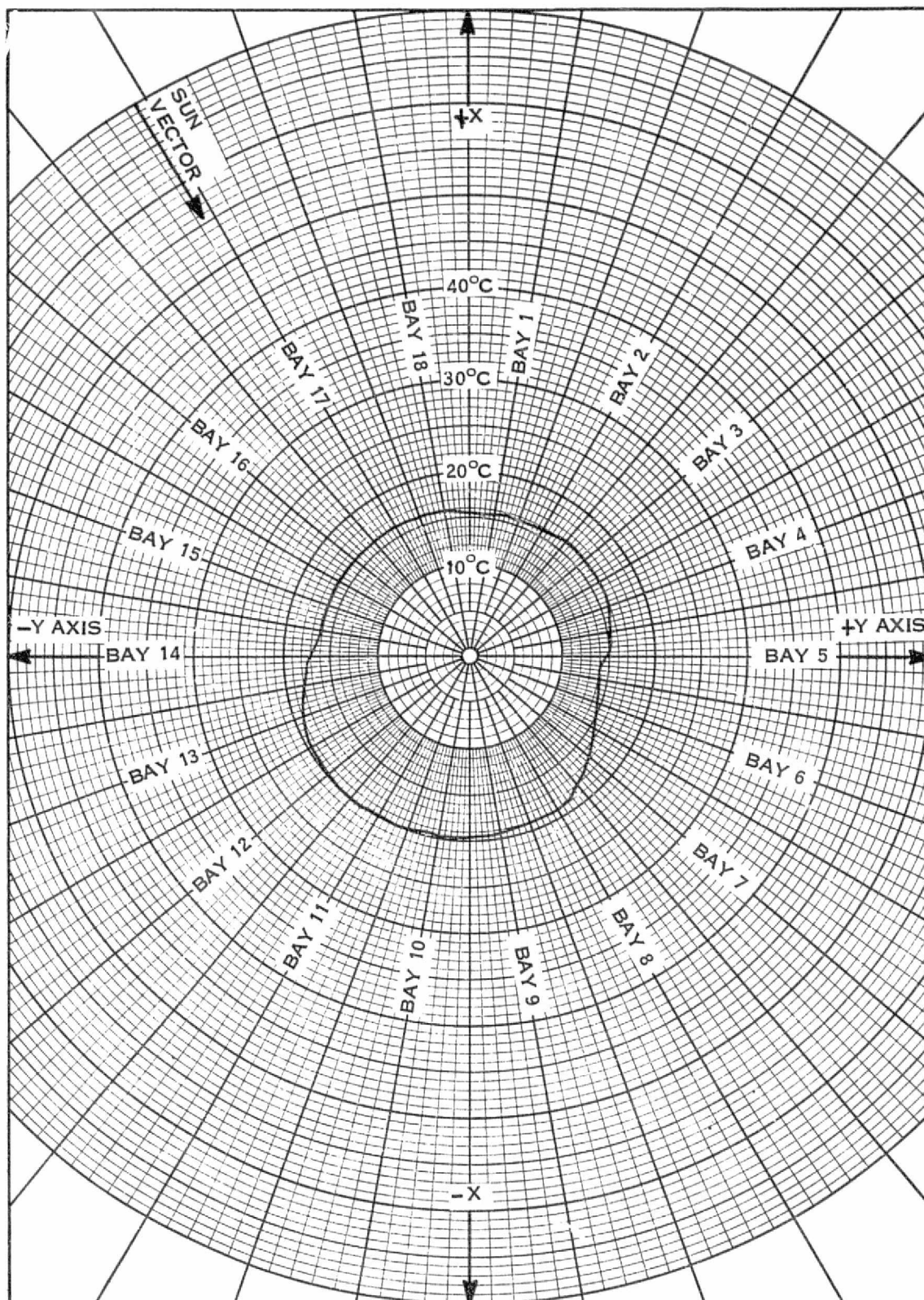


Figure 11-1. Landsat-3 Sensory Ring Average Temperatures
Orbit 1840 15 July 1978

Table 11-1. Landsat 3 Thermal Subsystem Analog Telemetry
(Average Value for Frames of Data Received in NBTR Playback)

Function No.	Name	Unit	Orbit					
			50	140	540	982	1464	1840
7001	THM TH02SBM	DGC	15.52	11.60	13.31	13.71	14.89	14.43
7002	THM TH01SBO	DGC	16.73	13.03	14.58	14.94	15.99	15.50
7003	THM TH03SBI	DGC	16.40	12.47	14.44	14.84	16.13	15.54
7004	THM TH10TCB	DGC	19.92	18.73	18.94	19.01	19.09	19.17
7005	THM TH11SBM	DGC	21.11	19.54	19.75	22.23	19.84	19.92
7006	THM TH05SBA	DGC	15.74	13.07	14.83	15.34	15.97	15.41
7007	OA-X THRUSTER	DGC	20.20	18.89	20.06	20.76	21.05	20.85
7008	THM TH02TCB	DGC	16.55	12.31	14.29	14.77	15.91	15.34
7009	THM TH07SBM	DGC	16.08	14.02	15.31	15.67	16.48	16.01
7010	THM TH08SBI	DGC	17.93	15.92	17.12	17.56	18.02	17.72
7011	THM TH09SBM	DGC	20.02	18.40	19.35	19.82	20.07	19.90
7012	THM TH10SBO	DGC	18.84	17.78	18.25	18.55	18.61	18.74
7013	THM TH04SBM	DGC	16.47	13.35	15.19	15.58	16.69	16.26
7014	THM TH11STO	DGC	20.46	19.19	19.31	19.32	19.41	19.56
7015	THM TH12SBI	DGC	21.64	19.71	19.61	19.44	19.51	19.60
7016	THM TH12STO	DGC	21.45	19.61	19.33	19.18	19.36	19.54
7017	RBV EEAM CTR LN	DGC	20.89	19.01	19.70	19.88	20.14	19.95
7018	THM TH13SBM	DGC	21.88	19.96	19.34	18.80	18.94	19.23
7019	NBR RAD OUTBDB4	DGC	2.73	0.53	1.07	1.97	2.53	2.09
7020	THM TH1	DGC	22.42	20.34	19.99	19.62	19.84	19.96
7021	THM TH14SBI	DGC	20.86	18.34	17.95	17.15	17.50	17.66
7022	THM TH14STO	DGC	20.48	18.20	17.54	16.82	17.00	17.18
7023	THM TH15SBM	DGC	19.95	17.30	16.67	15.60	16.18	16.34
7030	THM TH15STO	DGC	19.43	16.80	16.37	15.40	15.90	15.95
7033	THM TH05TCB	DGC	16.17	13.39	15.23	15.99	16.41	15.77
7035	THM TH18STM	DGC	18.04	13.77	15.37	15.35	16.47	16.02
7040	THM TH01TCB	DGC	16.45	12.67	14.19	14.55	15.64	15.35
7041	THM TH06STO	DGC	13.27	10.92	12.38	12.97	13.52	13.02
7042	THM TH03TCB	DGC	16.49	13.00	14.83	15.08	16.88	16.44
7043	THM TH04TCB	DGC	17.98	14.98	16.90	17.34	18.16	17.79
7044	THM TH17STO	DGC	17.99	14.78	15.31	14.94	16.13	16.21
7045	THM TH07TCB	DGC	16.16	14.20	15.43	15.92	16.41	16.15
7046	THM TH09TCB	DGC	18.83	17.69	18.28	18.82	18.84	18.69
7048	THM TH11TCB	DGC	21.59	20.01	20.08	20.06	20.07	20.07
7049	THM TH12TCB	DGC	21.45	19.57	19.07	18.73	18.86	19.04
7050	THM TH13TCB	DGC	22.25	20.50	19.80	19.19	19.31	19.62
7051	THM TH14TCB	DGC	20.75	18.14	17.47	16.52	16.07	17.20

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7041	THM TH01TCB	DGC	16.45	12.67	14.19	14.55	15.64	15.35
7042	THM TH06STO	DGC	13.27	10.92	12.38	12.97	13.52	13.02
7043	THM TH03TCB	DGC	16.49	13.00	14.83	15.08	16.88	16.44
7044	THM TH04TCB	DGC	17.98	14.98	16.90	17.34	18.16	17.79
7045	THM TH17STO	DGC	17.99	14.78	15.11	14.94	16.13	16.21
7046	THM TH07TCB	DGC	16.16	14.20	15.11	15.92	16.41	16.15
7048	THM TH09TCB	DGC	18.83	17.69	18.28	18.82	18.84	18.69
7049	THM TH11TCB	DGC	21.59	20.01	20.08	20.06	20.07	20.07
7050	THM TH12TCB	DGC	21.45	19.57	19.07	18.73	18.86	19.04
7051	THM TH13TCB	DGC	22.25	20.50	19.80	19.19	19.31	19.62
7052	THM TH14TCB	DGC	20.75	18.14	17.47	16.52	16.97	17.20
7053	THM TH16TCB	DGC	19.57	16.68	16.95	16.34	17.00	17.08
7054	THM TH17TCB	DGC	18.98	15.34	16.39	16.48	17.58	17.47
7055	THM TH18TCB	DGC	17.23	13.41	14.86	14.98	15.95	15.66
7060	THM SHUTTER BAY 1	DEG	9.90	1.48	1.14	0.00	2.14	0.69
7061	THM SHUTTER BAY 2	DEG	0.00	0.00	0.00	0.00	0.00	0.00
7062	THM SHUTTER BAY 3	DEG	1.07	0.00	0.00	0.00	7.02	3.75
7063	THM SHUTTER BAY 4	DEG	6.60	89.99	0.12	3.13	9.78	3.36
7064	THM SHUTTER BAY 5	DEG	6.00	1.04	1.18	1.33	3.33	2.81
7065	THM SHUTTER BAY 7	DEG	0.00	0.00	0.00	0.00	1.08	0.00
7067	THM SHUTTER BAY 9	DEG	28.82	18.49	24.14	27.20	28.00	27.19
7068	THM SHUTTER BAY 10	DEG	30.27	19.98	22.56	23.07	23.56	23.56
7069	THM SHUTTER BAY 11	DEG	40.32	29.07	30.11	29.65	29.52	28.70
7070	THM SHUTTER BAY 12	DEG	40.17	27.68	24.57	22.53	24.08	24.23
7071	THM SHUTTER BAY 13	DEG	36.13	22.07	19.09	13.10	15.57	16.84
7072	THM SHUTTER BAY 14	DEG	13.76	0.00	0.00	0.00	0.00	0.00
7074	THM SHUTTER BAY 16	DEG	17.35	0.00	0.00	0.00	0.00	0.00
7075	THM SHUTTER BAY 17	DEG	18.29	0.00	0.00	0.00	1.30	0.00
7076	THM SHUTTER BAY 18	DEG	11.42	0.00	0.00	0.00	0.00	0.00
7080	THM Q1 T ZENER V	TMV	4.93	4.92	4.92	4.92	4.92	4.93
7081	THM Q2 T ZENER V	TMV	5.08	5.08	5.08	5.09	5.09	5.09
7082	THM Q3 T ZENER V	TMV	5.05	5.05	5.05	5.05	5.05	5.35
7083	THM Q1 S ZENER V	TMV	5.01	5.00	5.00	5.00	5.00	5.00
7084	THM Q2 S ZENER V	TMV	4.90	4.90	4.90	4.90	4.90	4.90
7085	THM Q3 S ZENER V	TMV	5.03	5.03	5.03	5.03	5.04	5.04
7090	THM TH ECAM M	DGC	19.34	13.53	15.62	16.34	17.31	16.75
7091	THM IND ATTITUDE	DGC	21.11	18.82	18.51	17.75	18.05	18.13
7092	THM RBV RADIATOR	DGC	13.10	10.92	11.81	11.81	12.15	12.09
7093	THM RBVC CTR BM	DGC	17.80	15.43	16.30	16.27	16.70	16.56
7094	THM WBVTR BOOT	DGC	10.23	7.17	8.88	8.64	9.71	9.26
7095	THM WBVTR RAD CT	DGC	-1.22	-2.74	-1.52	-1.46	-0.55	-0.84
7096	THM WBVTR STRAP	DGC	12.84	9.22	10.98	10.93	12.03	11.57
7097	THM WBMT BAY 1	DGC	17.05	10.04	12.85	12.73	13.95	13.32
7098	THM WBMT BAY 18	DGC	16.50	9.69	12.80	12.41	13.48	12.84
7099	THM WBVTR SEP 3	DGC	15.40	11.34	13.23	13.45	14.69	14.15
7100	THM WBVTR SEP 17	DGC	18.42	14.32	15.64	15.37	16.38	16.09
7101	THM WBVTR 1 CENT	DGC	16.46	12.07	13.83	13.81	14.89	14.42
7102	THM VTR2 BAY 4	DGC	15.75	12.39	14.24	14.52	15.46	14.84
7103	THM VTR2 BAY 15	DGC	18.42	14.90	15.92	15.20	15.87	15.64
7104	THM WBVTR2 CTR	DGC	16.52	12.49	14.53	14.15	15.00	14.45
7105	THM NBTRB SEP 6	DGC	15.98	12.93	14.30	14.55	15.54	14.93
7106	THM NBTRB SEP 1	DGC	20.40	17.66	17.94	17.29	17.72	17.66
7107	THM NBTR BM CTR	DGC	17.71	14.36	15.98	15.58	16.40	15.93
7108	THM MSS MOUNT 14	DGC	16.14	13.68	14.56	13.81	14.79	14.41
7109	OA-Y THRUSTER	DGC	23.15	20.39	19.46	18.17	18.41	18.63
7110	THM MSS WBVTR BM	DGC	13.97	10.80	12.80	12.51	13.76	12.96
7111	OA-X THRUSTER	DGC	16.80	10.86	13.34	13.23	14.47	13.89

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7067	THM SHUTTER BAY 9	DEG	28.82	18.49	24.14	27.20	28.00	27.19
7068	THM SHUTTER BAY 10	DEG	30.27	19.98	22.56	23.07	23.56	23.56
7069	THM SHUTTER BAY 11	DEG	40.32	29.07	30.11	29.65	29.52	28.70
7070	THM SHUTTER BAY 12	DEG	40.17	27.68	24.57	22.53	24.08	24.23
7071	THM SHUTTER BAY 13	DEG	36.13	22.07	19.09	13.10	15.57	16.84
7072	THM SHUTTER BAY 14	DEG	13.76	0.00	0.00	0.00	0.00	0.00
7074	THM SHUTTER BAY 16	DEG	17.35	0.00	0.00	0.00	0.00	0.00
7075	THM SHUTTER BAY 17	DEG	18.29	0.00	0.00	0.00	1.30	0.00
7076	THM SHUTTER BAY 18	DEG	11.42	0.00	0.00	0.00	0.00	0.00
7080	THM Q1 T ZENER V	TMV	4.93	4.92	4.92	4.92	4.92	4.93
7081	THM Q2 T ZENER V	TMV	5.08	5.08	5.08	5.09	5.09	5.09
7082	THM Q3 T ZENER V	TMV	5.05	5.05	5.05	5.05	5.05	5.05
7083	THM Q1 S ZENER V	TMV	5.01	5.00	5.00	5.00	5.00	5.00
7084	THM Q2 S ZENER V	TMV	4.90	4.90	4.90	4.90	4.90	4.90
7085	THM Q3 S ZENER V	TMV	5.03	5.03	5.03	5.03	5.04	5.04
7090	THM TH ECAM M	DGC	19.34	13.53	15.62	16.34	17.31	16.75
7091	THM IND ATTITUDE	DGC	21.11	18.82	18.51	17.75	18.05	18.13
7092	THM RBV RADIATOR	DGC	13.10	10.92	11.81	11.81	12.15	12.09
7093	THM RBVC CTR BM	DGC	17.80	15.43	16.30	16.27	16.70	16.56
7094	THM WBVTR BOOT	DGC	10.23	7.17	8.88	8.64	9.71	9.26
7095	THM WBVTR RAD CT	DGC	-1.22	-2.74	-1.52	-1.46	-0.55	-0.84
7096	THM WBVTR STRAP	DGC	12.84	9.22	10.98	10.93	12.03	11.57
7097	THM WBMT BAY 1	DGC	17.05	10.04	12.85	12.73	13.95	13.32
7098	THM WBMT BAY 18	DGC	16.50	9.69	12.80	12.41	13.48	12.84
7099	THM WBVTR SEP 3	DGC	15.40	11.34	13.23	13.45	14.69	14.15
7100	THM WBVTR SEP 17	DGC	18.42	14.32	15.64	15.37	16.38	16.09
7101	THM WBVTR 1 CENT	DGC	16.46	12.07	13.83	13.81	14.89	14.42
7102	THM VTR2 BAY 4	DGC	15.75	12.39	14.24	14.52	15.46	14.84
7103	THM VTR2 BAY 15	DGC	18.42	14.90	15.92	15.20	15.87	15.64
7104	THM WBVTR2 CTR	DGC	16.52	12.49	14.53	14.15	15.00	14.45
7105	THM NBTRB SEP 6	DGC	15.98	12.93	14.30	14.55	15.54	14.93
7106	THM NBTRB SEP 1	DGC	20.40	17.66	17.94	17.29	17.72	17.66
7107	THM NBTR BM CTR	DGC	17.71	14.36	15.98	15.58	16.40	15.93
7108	THM MSS MOUNT 14	DGC	16.14	13.68	14.56	13.81	14.79	14.41
7109	OA-Y THRUSTER	DGC	23.15	20.39	19.46	18.17	18.41	18.63
7110	THM MSS WBVTR BM	DGC	13.97	10.80	12.80	12.51	13.76	12.96
7111	OA +X THRUSTER	DGC	16.80	10.86	13.34	13.23	14.47	13.89
7130	THM AVX P1 T	DGC	36.47	24.09	33.81	18.83	34.99	39.68
7131	THM AVXP2 T	DGC	33.24	35.13	27.59	30.81	16.09	19.84

LS-3

11-3/4

Table 11-2. Landsat-3 Compensation Load History

Compensation Load Status*

Orbits	1	2	3	4	5	6	7	8
Launch	0	0	0	0	0	0	0	0
3	0	0	X	X	X	0	X	X
34	0	0	X	X	X	X	X	X
48	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	X

SECTION 12
NARROWBAND TAPE RECORDERS (NBR)
LANDSAT-3

SECTION 12
NARROWBAND TAPE RECORDERS (NBR)

The Narrowband Recorder Subsystem operated satisfactorily throughout the entire report period, both Recorders alternating in Record and Playback modes with a nominal one minute overlap.

Table 12-1 gives cumulative operating hours for both Recorders by mode, and Table 12-2 gives typical telemetry values.

Table 12-1. NBR Operating Hours by Mode

NBR	On	Off	Playback	Record
A	1769	1596	70	1699
B	1769	1596	70	1699

Table 12-2. Narrow Band Tape Recorder Telemetry Values

Func	Name	Units	Orbit					
			30/31	174/215	564/565	1097/98	1524/25	1861/63
10001	A-Motor Current	mA	182.47	180.93	184.02	180.93	182.47	182.47
	Record P/B		179.38	185.57	177.83	179.38	177.83	176.29
10101	B-Motor Current	mA	150.00	143.88	148.47	148.47	143.88	143.88
	Record P/B		142.34	151.53	143.88	140.41	142.34	140.81
10002	A-Pwr Supply Cur	mA	167.57	164.19	167.57	167.57	170.95	170.95
	Record P/B		387.12	383.75	377.01	383.75	383.75	383.75
10102	B-Pwr Supply Cur	mA	186.67	190.00	186.66	190.00	186.66	186.66
	Record P/B		406.62	423.32	416.64	416.64	419.95	423.32
10003	A-Recorder Temp	DGC	20.43	18.70	20.65	21.09	17.61	18.91
10103	B-Recorder Temp	DGC	19.35	16.30	21.30	18.04	21.30	20.43
10004	A-Pwr Supply	VDC	-24.37	-24.50	-24.38	-24.38	-24.50	-24.50
10104	B-Pwr Supply	VDC	-24.38	-24.50	-24.50	-24.50	-24.38	-24.38

SECTION 13
WIDEBAND TELEMETRY SUBSYSTEM (WBTS)
LANDSAT-3

SECTION 13
WIDEBAND TELEMETRY SUBSYSTEM (WBTS)

The WBTS has operated nominally in this report period.

Table 13-1 shows typical telemetry values. All are nominal.

Signal levels measured at Goldstone with the spacecraft successively at the same two points in space, show continuous satisfactory performance.

Table 13-1. Typical Wideband Subsystem Telemetry

Func	Name	Units	Orbit					
			34/50	140	564/565	1020	1521	1840
12001	Temp TWT Coll.	DGC	39.38	33.75	34.81	36.25	38.13	34.38
12101			29.07	27.53	28.06	29.69	30.00	29.69
12002	Cur. Helix	mA	4.73	4.80	4.86	4.75	4.79	4.85
12102			6.50	6.40	6.34	6.24	6.22	6.38
12003	Cur. Cath	mA	44.50	44.68	44.35	44.17	44.40	44.03
12103			40.32	39.72	39.91	39.67	39.53	39.59
12004	Fwd. Pwr.	dBm	42.04	41.47	42.43	42.26	42.25	42.26
12104			42.46	42.42	42.82	42.81	42.79	42.82
12005	Refl. Pwr.	dBm	30.00	30.00	30.00	30.00	30.00	30.00
12105			31.80	31.48	31.20	31.80	31.74	31.80
12227	Mod A Volt Loop Stress	mHz	+1.45	+0.85	-0.25	-0.65	-0.81	-0.82
12228	Mod B Loop Stress	mHz	1.26	0.92	0.38	0.18	0.10	0.11
12229	Temp. Mod	DGC	1.26	13.31	17.00	17.84	17.25	16.25
12232	+15 VDC Pwr Suply	TMV	2.68	2.69	2.68	2.69	2.69	2.66
12234	-15 VDC Pwr Sud	TMV	4.38	4.36	4.35	4.39	4.34	4.34
12236	+5 VDC Pwr Suply	TMV	4.05	4.05	4.05	4.00	4.05	4.05
12238	-5 VDC Pwr Suply	TMV	5.18	5.14	5.18	5.17	5.13	5.12
12240	-24 VDC Unreg Pwr	TMV	6.15	6.25	6.25	6.18	6.12	6.19
12242	Temp. Inv.	DGC	18.45	14.42	18.21	17.98	17.75	17.05

SECTION 14

ATTITUDE MEASUREMENT SENSOR (AMS)
LANDSAT-3

SECTION 14
ATTITUDE MEASUREMENT SENSOR (AMS)

The AMS is a passive radiometric balance sensor which operates in the 14 - 16 micron IR Band. AMS Telemetry Values are shown in Table 14-1.

The AMS was launched in the OFF mode (CMD 774). It was turned ON during Orbit 5 and 17 has been performing normally since then.

Table 14-1. AMS Telemetry Values

Func	Name	Unit	Orbits					
			6	140	540	991	1431	1851
3004	Case - Temp 1	DGC	19.23	18.58	18.37	17.46	17.71	17.97
3005	Assembly - Temp 2	DGC	19.62	19.15	18.93	17.93	18.30	18.44

SECTION 15

WIDEBAND VIDEO TAPE RECORDERS (WBVTR)
LANDSAT-3

SECTION 15
WIDEBAND VIDEO TAPE RECORDERS (WBVTR)

The WBVTR subsystem (Recorders 1 and 2) operated satisfactorily during this report period. Minor frame sync error counts for WBVTR-2 (used with MSS data) have averaged below 5 per 10 seconds.

Tables 15-1, 15-2 and 15-3 show typical telemetry values for various recorded functions and modes. Figure 15-1 shows tape usage for Recorder 1 and 2.

Table 15-1. Telemetry Values for WBVTR-1 and -2

Func	Name	Unit	Orbits					
			42/45	174/215	564/565	1098/1121	1525/30	1861/63
13022	Tape Unit Press	PSI	16.25	16.12	16.12	16.12	16.12	16.12
13023	Tape Unit Temp	DGC	16.08	11.69	14.00	12.85	13.62	14.00
13024	Elect U. Temp	DGC	18.42	9.17	12.69	11.54	12.69	13.46
13032	Limiter Volt	VPP	1.38	1.38	1.39	1.39	1.38	1.40
13034	+ 5.6 VDC Conv	VDC	5.67	5.47	5.47	5.47	5.47	5.47
13122	Tape Unit Press	PSI	17.15	17.15	17.15	17.15	17.00	17.00
13123	Tape Unit Temp	DGC	16.75	14.77	16.69	15.92	16.30	15.92
13124	Elect U. Temp	DGC	19.62	13.08	16.92	15.77	18.07	17.30
13132	Limiter Volt	VPP	1.31	1.30	1.30	1.29	1.31	1.28
13134	+ 5.6 VDC Conv	VDC	5.42	5.45	5.65	5.50	5.27	5.45

Table 15-2. Telemetry Values for WBVTR-1

Func	Name	Units	Orbit					
			42/45	174/215	564/565	1098/1121	1524/25	1861/63
13029	Input P/B Voltage	VPP						
	Record		0.00	0.0	0.0	0.0	0.0	0.0
	Playback		0.89	0.89	0.81	0.84	0.86	0.86
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13028	Capstan Motor I	AMP						
	Record		0.35	0.28	0.28	0.27	0.33	0.27
	Playback		0.40	0.30	0.29	0.33	0.34	0.32
	Rewind		0.23	0.22	0.22	0.20	0.16	0.17
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13030	Headwheel Motor I	AMP						
	Record		0.50	0.45	0.50	0.49	0.48	0.48
	Playback		0.48	0.46	0.47	0.44	0.42	0.44
	Rewind		0.41	0.37	0.39	0.37	0.37	0.37
	Standby		0.43	0.37	0.39	0.36	0.37	0.37
13031	Recorder Input I	AMP						
	Record		3.17	2.82	3.06	2.92	2.89	3.03
	Playback		3.03	2.68	2.68	2.61	2.58	2.68
	Rewind		1.60	1.47	1.50	1.45	1.42	1.45
	Standby		1.28	1.27	1.27	1.27	1.25	1.30
13033	Servo Voltage	PCT						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		49.10	49.38	49.32	49.27	49.43	49.83
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13026	Capstan Motor Spd	PCT						
	Record		101.64	103.41	102.82	102.82	102.82	102.82
	Playback		101.05	102.82	102.82	102.82	102.82	102.23
	Rewind		108.15	106.38	106.97	106.38	106.38	106.38
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13027	Headwheel Mtr Spd	PCT						
	Record		101.13	100.60	101.13	100.60	101.13	101.13
	Playback		101.65	101.13	101.13	101.13	101.13	101.13
	Rewind		102.71	101.65	102.18	101.65	102.18	102.18
	Standby		102.71	102.18	102.18	102.18	102.18	102.18

Table 15-3. Telemetry Values for WBVTR-2

Func	Name	Units	Orbit					
			42/45	174/215	564/565	1097/98	1530	1861/63
13129	Input P/B Voltage	VPP						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		0.58	0.62	0.58	0.58	0.61	0.57
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13128	Capstan Motor I	AMP						
	Record		0.45	0.39	0.46	0.32	0.37	0.30
	Playback		0.28	0.35	0.29	0.33	0.37	0.35
	Rewind		0.18	0.19	0.19	0.16	0.20	0.18
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13130	Headwheel Motor I	AMP						
	Record		0.43	0.45	0.40	0.46	0.48	0.46
	Playback		0.47	0.45	0.44	0.43	0.47	0.45
	Rewind		0.40	0.39	0.39	0.39	0.41	0.39
	Standby		0.42	0.39	0.39	0.38	0.42	0.38
13131	Recorder Input I	AMP						
	Record		2.39	2.24	2.48	2.36	2.67	2.48
	Playback		2.79	2.18	2.39	2.30	2.64	2.36
	Rewind		1.20	1.05	1.15	1.03	1.28	1.23
	Standby		1.03	0.89	0.95	0.87	1.05	0.91
13133	Servo Voltage	PCT						
	Record		0.0	0.0	0.0	0.0	0.0	0.0
	Playback		50.29	50.29	50.29	50.39	50.49	50.39
	Rewind		0.0	0.0	0.0	0.0	0.0	0.0
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13126	Capstan Motor Spd	PCT						
	Record		98.35	99.65	98.35	99.00	98.35	99.00
	Playback		96.41	99.35	97.70	97.70	97.06	97.06
	Rewind		98.35	97.70	98.35	97.70	99.00	99.00
	Standby		0.0	0.0	0.0	0.0	0.0	0.0
13127	Headwheel Mtr Spd	PCT						
	Record		104.09	102.87	104.09	104.09	104.09	103.48
	Playback		102.87	102.26	102.87	102.87	102.87	102.87
	Rewind		103.97	104.09	104.70	104.09	105.32	105.32
	Standby		104.10	104.09	104.70	104.70	105.32	105.32

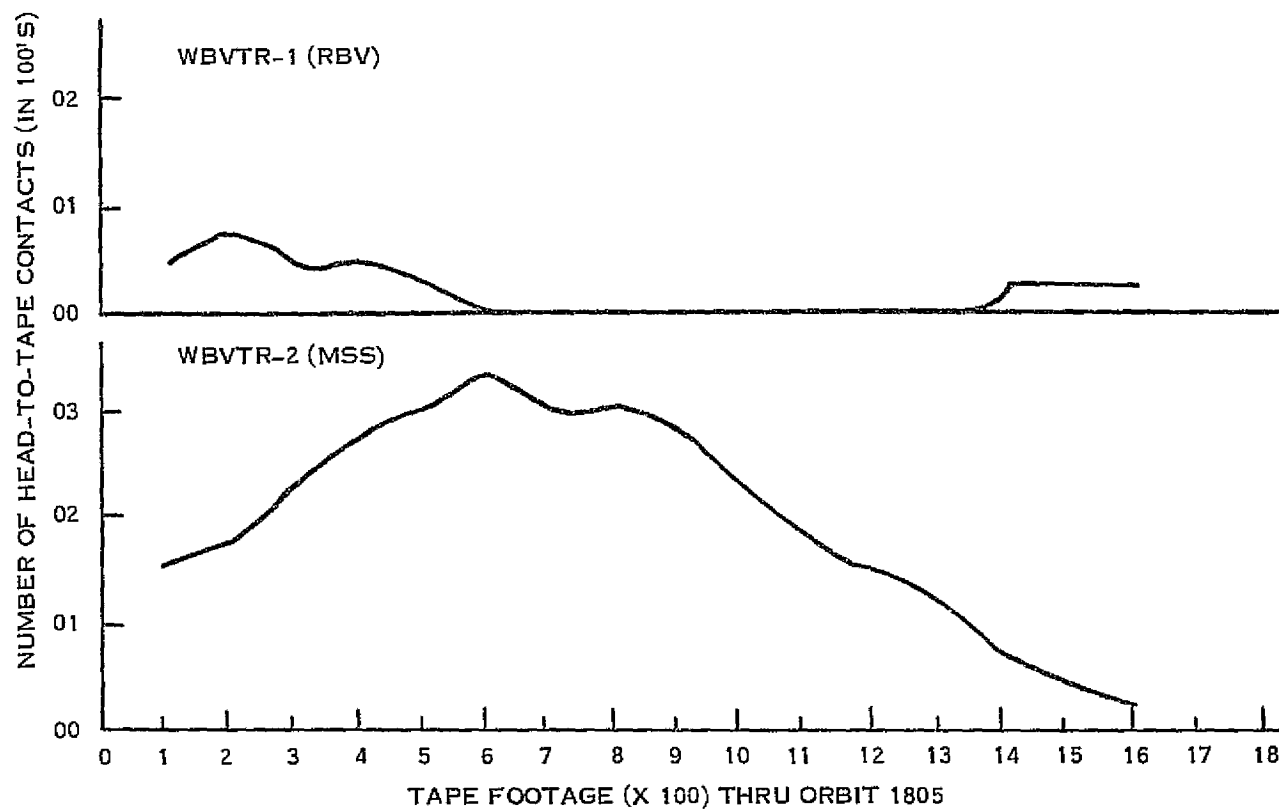


Figure 15-1. Landsat-3 WBR Tape Usage

SECTION 16

RETURN BEAM VIDICON (RBV)

LANDSAT-3

SECTION 16
RETURN BEAM VIDICON (RBV)

The RBV operated satisfactorily during this report period.

The white-clip anomaly continues to occur occasionally in the first five percent of the image format of Camera 1. No cause has been determined to date.

Table 16-1 gives typical telemetry values for the RBV subsystem. Tables 16-2 and 16-3 give telemetry values for Prepare, Read and Hold modes for the two RBV Cameras.

Table 16-1. RBV Telemetry Values

Func	Name	Unit	Orbit					
			34	174	565	1098	1525	1863
14001	CCC Board Temp.	DGC	21.84	19.94	20.49	20.49	20.49	20.49
14002	CCC Pwr. Sup. Temp	DGC	23.39	21.60	21.60	21.60	21.60	22.70
14003	15 Vdc Sup.	TMV	4.00	4.00	3.97	4.00	4.00	3.97
14004	+6 V, -5, VDC Sup.	TMV	3.07	3.07	3.07	3.07	3.07	3.05
14100	VID Output V	TMV	0.88	1.27	2.25	1.77	1.10	1.77
14200			0.76	1.82	0.95	2.70	1.50	1.45
14102	Comb. Align Cur.	TMV	4.15	4.17	4.15	4.15	4.15	4.15
14202			4.13	4.15	4.15	4.15	4.15	4.15
14103	Elec Temp	DGC	19.23	16.62	18.28	18.28	18.28	18.28
14203			23.45	22.60	22.05	20.94	20.39	21.05
14104	LV Pwr Sup T.	DGC	19.05	16.73	18.39	17.83	18.39	17.83
14204			23.10	22.15	21.60	20.49	19.94	20.49
14105	Defl. Pwr. Sup. +10 VDC	TMV	4.02	4.02	4.02	4.05	4.00	4.00
14205			4.05	4.07	4.07	4.07	4.05	4.07
14106	L. V. P. S. +6 V, -6.3 VDC	TMV	3.77	3.77	3.77	3.77	3.77	3.75
14206			3.75	3.77	3.75	3.75	3.75	3.75
14107	Ther. Elec. Cur.	TMV	3.02	2.77	2.60	4.10	3.52	3.80
14207			2.57	2.77	2.60	4.00	3.57	3.80
14108	Vid. Fil. Cur.	TMV	2.62	2.60	2.57	2.65	2.57	2.60
14208			2.38	2.60	2.60	2.75	2.62	2.65
14110	Vid. Tgt. Volt	TMV	3.55	3.37	3.37	3.37	3.52	3.37
14210			3.06	3.37	3.35	3.32	3.32	3.32
14113	Vert Def V	TMV	3.20	3.02	3.02	3.02	2.95	3.02
14213			2.78	2.97	2.95	2.95	2.97	3.27
14114	Vid FTP	DGC	24.10	23.10	23.65	23.65	23.10	23.10
14214			23.90	22.09	22.60	22.60	22.09	22.09
14115	Foc Coil T	DGC	19.80	17.07	18.18	18.18	18.18	18.18
14215			20.00	17.07	18.18	18.18	18.18	18.18

* 141XX refers to Camera 1
142XX refers to Camera 2

Table 16-2. Camera No. 1 Telemetry (Values in TMV)

Func	Name	Units	Orbit						
			Mode	34	174	565	1098	1525	1863
14101	Focus I	TMV	Prep	1.65	1.60	1.62	1.65	1.62	1.65
			Read	2.77	2.75	2.75	2.77	2.77	2.80
			Hold	0.55	0.52	0.52	0.52	0.52	0.52
14109	Grid V	TMV	Prep	0.70	0.70	0.70	0.72	0.72	0.27
			Read	2.20	2.22	2.20	2.22	2.22	2.20
			Hold	4.15	4.15	4.15	4.15	4.17	4.17
14111	Cath I	TMV	Prep	3.10	3.12	3.12	3.12	3.12	3.10
			Read	0.77	0.77	0.77	0.77	0.77	0.77
			Hold	0.40	0.40	0.40	0.40	0.40	0.40
14112	Hor Def	TMV	Prep	2.00	1.97	2.02	2.02	2.00	2.02
			Read	3.42	3.45	3.45	3.45	3.45	3.45
			Hold	0.0	0.0	0.0	0.02	0.02	0.02
14120	+ 500 V	TMV	Prep	1.07	1.07	1.07	1.05	1.05	1.05
			Read	4.17	4.17	4.17	4.20	4.17	4.17
			Hold	4.17	4.17	4.17	4.20	4.17	4.17

Table 16-3. Camera No. 2 Telemetry (Values in TMV)

Func	Name	Units	Mode	34	174	565	1098	1525	1863
14101	Focus I	TMV	Prep	1.57	1.57	1.57	1.55	1.55	1.55
			Read	2.70	2.70	2.70	2.67	2.67	2.67
			Hold	0.50	0.50	0.50	0.47	0.47	0.47
14109	Grid V	TMV	Prep	0.55	0.55	0.55	0.55	0.55	0.55
			Read	1.90	1.92	1.92	1.95	1.92	1.90
			Hold	4.15	4.15	4.15	4.15	4.17	4.17
14111	Cath I	TMV	Prep	3.30	3.32	3.32	3.32	3.32	3.32
			Read	0.90	0.92	0.92	0.92	0.92	0.92
			Hold	0.40	0.40	0.40	0.40	0.40	0.40
14112	Hor Def	TMV	Prep	1.67	1.67	1.62	1.70	1.72	1.70
			Read	3.45	3.45	3.45	3.05	3.05	3.02
			Hold	0.0	0.0	0.0	0.02	0.02	0.02
14120	+500 V	TMV	Prep	1.10	1.22	1.12	1.10	1.10	1.12
			Read	4.25	4.25	4.25	4.25	4.25	4.25
			Hold	4.25	4.25	4.25	4.25	4.25	4.25

SECTION 17

MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

LANDSAT-3

SECTION 17
MULTISPECTRAL SCANNER SUBSYSTEM (MSS)

Bands 1 through 4 of the MSS operated nominally in this report period.

Band 5 was first turned ON in Orbit 222 on 21 March 1978, 16 days after launch. Cumulative sensor contamination, due to residual gas molecules, caused response to decline at an average rate of 0.5% per hour. The sensors were periodically outgassed, typically for 4 days, restoring original response level. By early July, the rate of decline in sensor response had dropped to 0.13% per hour. At turn ON after the 6th outgas period (which had been extended to 10 days) the response of the sensors was about 80% of the value observed after previous outgas periods. After the 7th outgas period, (Orbit 1783 on 11 July 1978) sensor 26 appeared nominal at the new (~20%) level, but no output was visible from sensor 25. Tests in 3 subsequent orbits confirmed the absence of output from Sensor 25. The bias telemetry for this sensor reads 6.375 TMV rather than the normal 3.650. Since Orbit 1812 on July 12, 1978, Band 5 has been turned OFF pending study.

Figure 17-1A and 1B show the number of scenes imaged at each geographic location since launch. Figure 17-1A shows the scenes taken during the north-to-south passage (as in all prior quarterly reports) from all 5 bands. Figure 17-1B shows the scenes taken during the south-to-north passages (i.e., the "night" side of the earth) from the infrared sensors in Band 5. The Antarctica, therefore is at the top of this map, and the northern-most earth latitudes are at the bottom. Only those scenes received by the U.S. ground stations are shown. Scenes transmitted to Canada, Brazil and Italy (49% of the total) are not shown.

FOLDOUT FRAME.

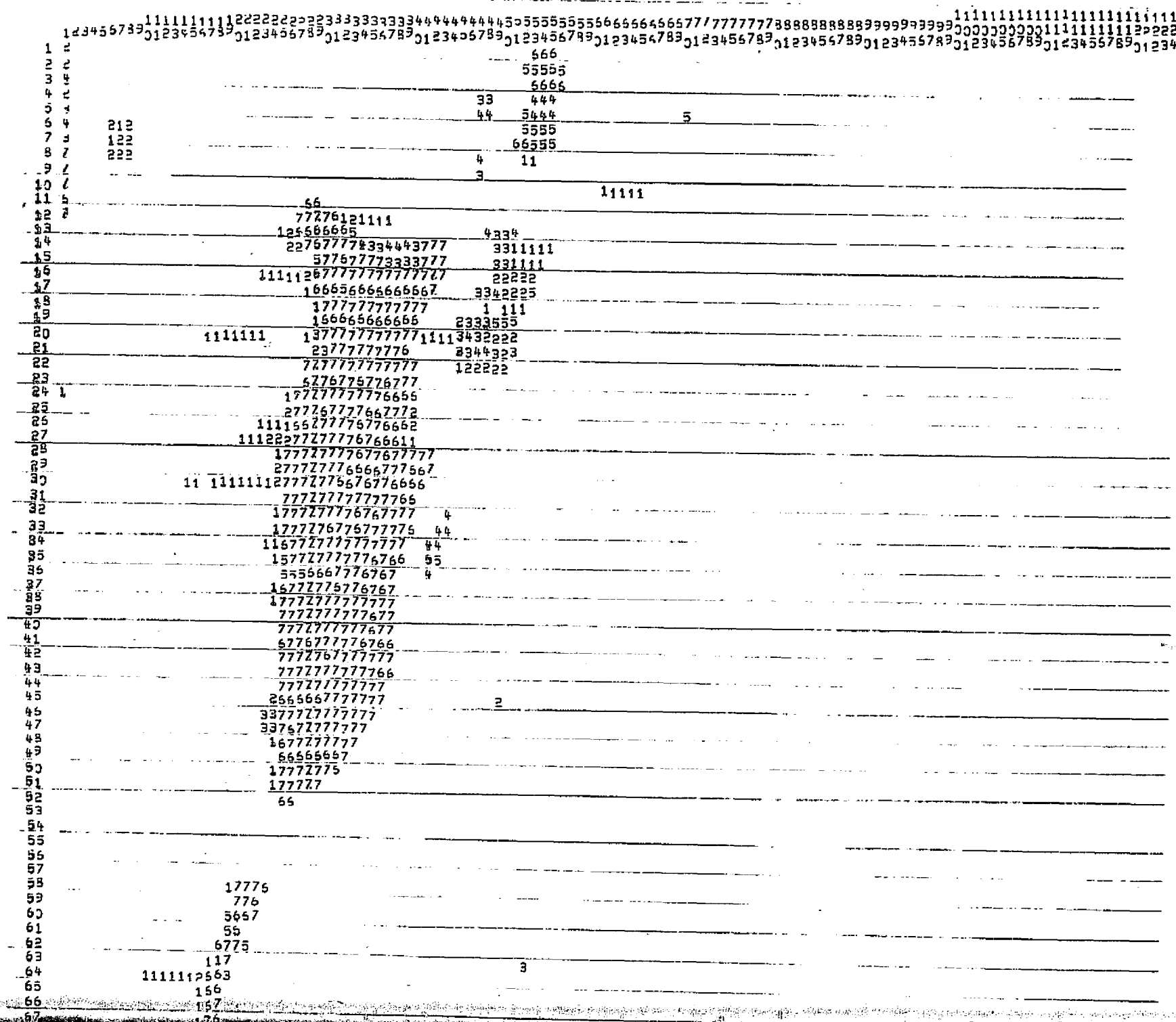
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Launch, Landsat-3

LS-3

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Figure 17-1A. Computer Map of MSS



OLDOUT FRAME 2

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79 55566666666
80 55666666666
81 777777777776
82 555666666667
83 5766776777776
84 5666666666654
85 667677775
86 555666665
87 777777 77
88 777777 75
89 55775 65
90 65555 33
91 777 55
92 74

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95 11
96 1111222333
97 1
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99 4
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101 11 56776
102 777767
103 111 531
104 111 1 441
105 1111 4
106 11 3
107 2222
108 23 5
109 23
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111 2
112 111133 222
113 323
114 333
115 2211 111
116 1221111
117 111111
118 113311
119 2
120 21
121 111 12 11 111
122 56566 1 111
123 6777111 11 11132 111 11
124 6666661 11 11 1111
125 455556666 22111111111221111
126 555666666 11
127 56666666511 77 11 11 11 11
128 66666666655556667
129 66666666656767677775 4
130 6666666667776661115 44
131 4555566666666544344 11 44
132 44566666666666544455 11
133 66666666666 11111
134 4 576777775
135 56666
136 55666 11
137 7777777 11
138 676666666 11
139 54555544
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141 122 11
142 53 111 1 31
143 111
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145 55 35332
146 55333
147 54333
148 45443
149 3 33332

OLDOUT

171	665555	444444				
172		55	656			
173	565656					
174			333			
175	5545554		222			
176						
177	4446666					
178		2				
179	5555455			11	221	111111
180				111	1111111	
181	5555555			232331	1	11111111
182				3333	1	1111
183	55554577777			2222		111
184				1	33	11
185	666655677777	22		222		11
186				222	11	11
187	455554366545	2		222	12111	11
188				22	11111	11
189	566666667777	1			221222	1
190		331		111	2	11
191	46666667777	442				
192		341				
193	5555556666					
194						
195	6666667755556	2				
196		777				
197	4555557766777	11				1111
198		66				
199	6666666655556	22	11			11
200						
201	6555556655556					11
202						
203	77777777776					
204						
205	7777777	1				
206						
207	76666					
208	6666					
209	7776		211			
210	6544		2			
211			11			
212	11		22			
213						
214			222			
215			22211111			
216			111			
217		111				
218		11				
219		11				
220			11			
221			11			
222						
223	7					1
224	7					
225	7					
226	5					
227	5					
228	5					
229	5					
230	5					
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238	5					
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242	5					
243	5					
244	5	22				
245	5					
246	5	111				
247	5	511				
248	5					
249	5					
250	5					

IN 5

REBOUND FRAME

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REPO SEC-5 VITA 5-41 3390 540

	21573	11224	11241	11214	7975	15261	
	100.00%	52.00%	52.11%	51.98%	37.37%	69.31%	
R Y			A V A I	A B	- E		
30%	30%	40%	50%	50%	70%	80%	100%
703	610	581	491	477	502	662	462

ORIGINAL PAGE IS
OF POOR QUALITY

Figure 17-1B. Computer Map of MSS
Scenes in S to N Passages (Night)
Since Launch, Landsat-3

FOLDOUT FRAME 3
ORIGINAL PAGE IS
OF POOR QUALITY

1111111121 1
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11111111112
1111111111 1
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Table 17-1. MSS Analog Telemetry - Landsat 3

Func	Name	Units	Orbit					
			50	140	602	1010	1521	1840
15021	Band 5 15V	TMV	F	F	4.83	4.82	4.80	F
15022	Band 5 PA Case Temp	DGC	11.15	10.95	13.38	13.38	13.80	13.01
15025	Ch 25 Bias	TMV	F	F	3.91	3.82	3.67	F
15026	Ch 26 Bias	TMV	F	F	3.66	3.65	3.61	F
15040	Mux -6 V	VDC	6.19	6.19	6.18	6.18	6.17	6.17
15041	A/D Conv Ref. Voltage	VDC	3.60	3.60	3.60	3.60	3.60	3.60
15042	Avg Den Data Trans	TMV	1.92	2.28	0.09	0.07	0.12	0.32
15043	Fiber Opt Plate 1 Temp	DGC	13.92	12.93	14.66	14.70	15.31	14.93
15044	Fiber Pt Plate 2 Temp	DGC	12.66	11.55	13.29	13.22	13.59	13.28
15045	Multiplexer Temp	DGC	18.37	15.43	16.27	15.76	17.29	18.42
15046	Elect. Cover Temp	DGC	14.23	15.04	17.19	16.77	17.99	17.77
15047	Power Supply Temp	DGC	14.31	13.27	14.95	14.51	15.70	15.60
15048	Scan Mirror Reg Temp	DGC	12.61	11.21	13.07	12.36	13.77	13.98
15049	Scan Mirror Drive Elect. T.	DGC	12.94	11.81	13.59	12.83	14.45	14.85
15050	Scan Mirror Drive Coil T	DGC	12.69	11.38	13.21	12.59	13.85	13.90
15051	Scan Mirror Temp	DGC	12.25	10.69	12.64	12.00	13.16	13.13
15052	Rot Sht Hsg Temp	DGC	13.93	13.04	14.65	14.59	15.11	14.78
15053	Scan Mirror Reg Volt	VDC	24.02	24.02	23.36	23.30	23.35	23.35
15054	Cal Lamp Current	mA	112.50	112.50	112.50	112.50	112.56	112.50
15055	BD 1 15 V	TMV	5.07	5.07	5.07	5.07	5.07	5.07
15056	BD 2 15 V	TMV	5.05	5.05	5.05	5.05	5.05	5.05
15057	BD 3 15 V	TMV	5.10	5.10	5.10	5.10	5.10	5.10
15058	BD 4 15 V	TMV	5.02	5.02	5.02	5.02	5.02	5.02
15059	TLM -15 V	VDC	-15.17	-15.17	-15.17	-15.17	-15.17	-15.17
15060	SM Reg +12 V/-6 V	TMV	5.00	5.00	5.00	5.00	5.00	5.00
15061	Logic +5 V	TMV	4.90	4.91	4.90	4.87	4.87	4.90
15062	+19 V Rect Out	TMV	6.02	5.89	5.88	5.86	5.89	6.02
15063	-19 V Rect Out	TMV	4.30	4.23	4.22	4.20	4.22	4.31
15064	BD 1 HVA	TMV	5.00	5.00	5.00	5.00	5.00	5.00
15065	BD 1 HVB	TMV	F	F	F	F	F	F
15066	BD 2 HVA	TMV	5.04	5.02	5.05	5.05	5.05	5.05
15067	BD 2 HVB	TMV	F	F	F	F	F	F
15068	BD 3 HVA	TMV	5.00	5.00	5.02	5.02	5.02	5.02
15069	BD 3 HVB	TMV	F	F	F	F	F	F
15070	Shtr Mtr Con. Int.	TMV	2.55	2.55	2.54	2.55	2.54	2.54
15071	Scan Mirror Drive	VDC	-7.95	-8.00	-8.00	-8.02	-7.99	-8.01
15080	RAD Cool 1st Stg T	DGC	F	F	-112.76	-112.89	-112.60	-112.67
15081	RAD Cool 2nd Stg W T	DGC	F	F	-181.00	-181.00	-181.00	-181.00
15082	RAD Cool Stg N T	DGC	F	F	-180.68	-180.72	-180.52	-180.80

F = Unit Off

Table 17-2. MSS Response History - Landsat-3

Quantum Level for Constant Calibration Lamp Input
(0 = Black; 63 = White)

Band	Sensor	Average Value in Orbit			% Chg Since Launch
		at 1st Turn On	1st Quar*	This Quar	
1	1	54	51	48	-11
	2	49	46	44	-10
	3	48	46	45	-6
	4	50	46	44	-12
	5	51	48	47	-8
	6	48	46	43	-10
2	7	55	54	52	-5
	8	56	53	52	-7
	9	52	49	47	-10
	10	53	50	49	-8
	11	56	52	52	-7
	12	53	52	51	-4
3	13	56	53	53	-5
	14	55	52	52	-5
	15	53	52	49	-8
	16	51	50	49	-4
	17	57	53	51	-11
	18	53	51	51	-4
4	19	32	32	33	+3
	20	34	34	35	+3
	21	38	38	39	+3
	22	34	35	35	+3
	23	35	36	36	+3
	24	30	30	31	+3
5	25**	25.2	24.5	Q	-100
	26**	21.4	20.8	19.3	-9.8
Line Length		3187	3187	3186	-0.03

* = Corrected values from delayed processed data

** = Measured in gain step A, immediately after cool-down

Q = Failed during 7th outgas period (July 9-11)

SECTION 18
DATA COLLECTION SYSTEM (DCS)
LANDSAT-3

SECTION 18
DATA COLLECTION SUBSYSTEM (DCS)

The DCS Subsystem Performed nominally during this report period, continuing message collection at the normal rate.

Figure 18-1 shows the number of DCS messages received in each 18-day cycle at OCC. Active DCP's in the field average about 94. The percentage of good messages is about 96%.

There are 48 users in the data base; 267 DCP's are in the data base.

Table 18-1 shows telemetry values since launch. All are nominal.

Table 18-1. DCS Telemetry Values

Func	Name	Units	43	152	590	1020	1521	1840
16001	Receiver 1 Sig Strength	dBm	-125	-128.17	-130.43	-124.87	-127.21	-129.26
16002	Receiver 1 Temp.	DGC	19.05	19.36	18.94	19.73	19.00	19.11
16003	Rec-1 Pwr Input Volt	VDC	2.35	2.35	2.34	2.34	2.34	2.34
16004	Receiver 2 Sig Strength	dBm	F	F	F	F	F	F
16005	Receiver 2 Temp.	DGC	F	F	F	F	F	F
16006	Receiver 2 Input Volt	VDC	F	F	F	F	F	F

F = Unit Off

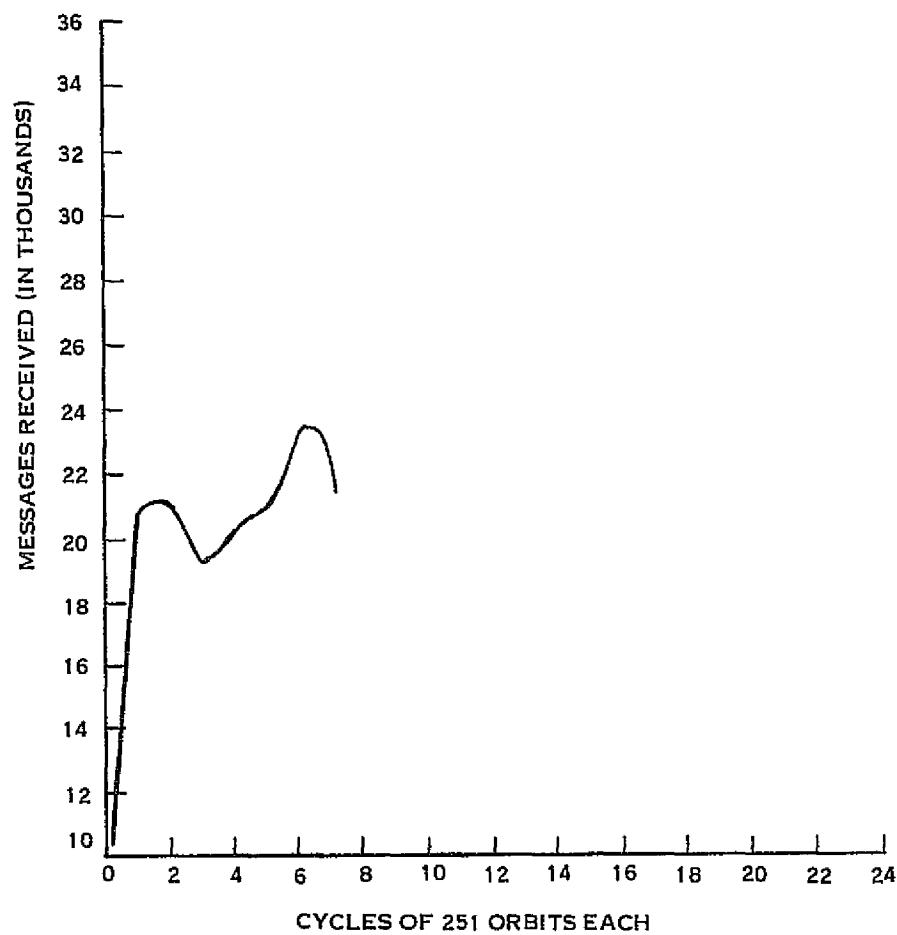


Figure 18-1. Landsat-3 Number of DCS Messages for an 18-Day Cycle

APPENDIX A
LANDSAT-3 ANOMALIES AND OBSERVATIONS

APPENDIX A
LANDSAT-3 ANOMALIES AND OBSERVATIONS

<u>Date</u>	<u>Anomaly/Observation</u>	<u>How Observed</u>	<u>Comments</u>
3/8/78	Cell 4 of B Comstor would not verify. MDR D04942	On-Line	Cell 4 of B Comstor would not load properly in Orbits 41, 45 and 48. Operational use discontinued on 3/18/78 when all "1's" appeared in cell 4. Tested and operation resumed in Orbit 1897 on 19 July 1978 with cell 4 non-operational.
3/9/78	RBV had intermittent white level saturation in first 5% of image. MDR D04939	Off-Line	White level saturation occurred in first 5% of images at intermittent occurrence.
5/4/78	ECAM halted on checksum. MDR D04941	On-Line	ECAM halted on internal check on Orbit 839 (5 May 1978). Memory fault not critical and stable. Checksum changed and operation continued. Reoccurred at new non-critical memory location on 31 May 1978. Checksum changed and returned to operation.
7/11/78	No output from sensor 25 video output on MSS Band 5. MDR D04943	On-Line	First operation after 7th outgas cycle showed sensor 25 failed. Sensor 26 was lower but operating. Bands 1-4 normal.

APPENDIX B

LANDSAT-3 SPACECRAFT ORBIT REFERENCE TABLES

APPENDIX B
LANDSAT-3
SPACECRAFT ORBIT REFERENCE TABLES
FROM LAUNCH, 5 MARCH 1978 THROUGH OCTOBER 1978
ORBITS 0 TO 3350
FLIGHT DAY 0 THROUGH 241

Landsat-3
March 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1						
2						
3						
4						
5	64	1	0-3			0
6	65	2	4-17			0
7	66	3	18-31			0
8	67	4	32-45			0
9	68	5	46-59			0
10	69	6	60-73			0
11	70	7	74-87			0
12	71	8	88-101			0
13	72	9	102-115			0
14	73	10	116-129			0
15	74	11	130-143	1-14	1	1
16	75	12	144-157	15-28	2	1
17	76	13	158-171	29-42	3	1
18	77	14	172-185	43-56	4	1
19	78	15	186-199	57-70	5	1
20	79	16	200-213	71-84	6	1
21	80	17	214-227	85-98	7	1
22	81	18	228-241	99-112	8	1
23	82	19	242-255	113-126	9	1
24	83	20	256-269	127-139	10	1
25	84	21	269-282	140-153	11	1
26	85	22	283-296	154-167	12	1
27	86	23	297-310	168-181	13	1
28	87	24	311-324	182-195	14	1
29	88	25	325-338	196-209	15	1
30	89	26	339-352	210-223	16	1
31	90	27	353-366	224-237	17	1

Landsat-3
March 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1						
2						
3						
4						
5	64	1	0-3			0
6	65	2	4-17			0
7	66	3	18-31			0
8	67	4	32-45			0
9	68	5	46-59			0
10	69	6	60-73			0
11	70	7	74-87			0
12	71	8	88-101			0
13	72	9	102-115			0
14	73	10	116-129			0
15	74	11	130-143	1-14	1	1
16	75	12	144-157	15-28	2	1
17	76	13	158-171	29-42	3	1
18	77	14	172-185	43-56	4	1
19	78	15	186-199	57-70	5	1
20	79	16	200-213	71-84	6	1
21	80	17	214-227	85-98	7	1
22	81	18	228-241	99-112	8	1
23	82	19	242-255	113-126	9	1
24	83	20	256-268	127-139	10	1
25	84	21	269-282	140-153	11	1
26	85	22	283-296	154-167	12	1
27	86	23	297-310	168-181	13	1
28	87	24	311-324	182-195	14	1
29	88	25	325-338	196-209	15	1
30	89	26	339-352	210-223	16	1
31	90	27	353-366	224-237	17	1

C-3

Landsat-3

April 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	91	28	367-380	238-251	18	1
2	92	29	381-394	1-14	1	2
3	93	30	395-408	15-28	2	2
4	94	31	409-422	29-42	3	2
5	95	32	423-436	43-56	4	2
6	96	33	437-450	57-70	5	2
7	97	34	451-464	71-84	6	2
8	98	35	465-478	85-98	7	2
9	99	36	479-492	99-112	8	2
10	100	37	493-506	113-126	9	2
11	101	38	507-519	127-139	10	2
12	102	39	520-533	140-153	11	2
13	103	40	534-547	154-167	12	2
14	104	41	548-561	168-181	13	2
15	105	42	562-575	182-195	14	2
16	106	43	576-589	196-209	15	2
17	107	44	590-603	210-223	16	2
18	108	45	604-617	224-237	17	2
19	109	46	618-631	238-251	18	2
20	110	47	632-645	1- 14	1	2
21	111	48	646-659	15- 28	2	2
22	112	49	660-673	29- 42	3	2
23	113	50	674-687	43- 56	4	2
24	114	51	688-701	57- 70	5	2
25	115	52	702-715	71- 84	6	2
26	116	53	716-729	85- 98	7	2
27	117	54	730-743	99-112	8	2
28	118	55	744-757	113-126	9	2
29	119	56	758-770	127-139	10	2
30	120	57	771-784	140-153	11	2

Landsat-3

May 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	121	58	785-798	154-167	12	3
2	122	59	799-812	168-181	13	3
3	123	60	813-826	182-195	14	3
4	124	61	827-840	196-209	15	3
5	125	62	841-854	210-223	16	3
6	126	63	855-868	224-237	17	3
7	127	64	869-882	238-251	18	3
8	128	65	883-896	1-14	1	4
9	129	66	897-910	15-28	2	4
10	130	67	911-924	29-42	3	4
11	131	68	925-938	43-56	4	4
12	132	69	939-952	57-70	5	4
13	133	70	953-966	71-84	6	4
14	134	71	967-980	85-98	7	4
15	135	72	981-994	99-112	8	4
16	136	73	995-1008	113-126	9	4
17	137	74	1009-1021	127-139	10	4
18	138	75	1022-1035	140-153	11	4
19	139	76	1036-1049	154-167	12	4
20	140	77	1050-1063	168-181	13	4
21	141	78	1064-1077	182-195	14	4
22	142	79	1078-1091	196-209	15	4
23	143	80	1092-1105	210-223	16	4
24	144	81	1106-1119	224-237	17	4
25	145	82	1120-1133	238-251	18	4
26	146	83	1134-1147	1-14	1	5
27	147	84	1148-1161	15-28	2	5
28	148	85	1162-1175	29-42	3	5
29	149	86	1176-1189	43-56	4	5
30	150	87	1190-1203	57-70	5	5
31	151	88	1204-1217	71-84	6	5

Landsat-3

June 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	152	89	1218-1231	85-98	7	5
2	153	90	1232-1245	99-112	8	5
3	154	91	1246-1259	113-126	9	5
4	155	92	1260-1272	127-139	10	5
5	156	93	1273-1286	140-153	11	5
6	157	94	1287-1300	154-167	12	5
7	158	95	1301-1314	168-181	13	5
8	159	96	1315-1328	182-195	14	5
9	160	97	1329-1342	196-209	15	5
10	161	98	1343-1356	210-223	16	5
11	162	99	1357-1370	224-237	17	5
12	163	100	1371-1384	238-251	18	5
13	164	101	1385-1398	1-14	1	6
14	165	102	1399-1412	15-28	2	6
15	166	103	1413-1426	29-42	3	6
16	167	104	1427-1440	43-56	4	6
17	168	105	1441-1454	57-70	5	6
18	169	106	1455-1468	71-84	6	6
19	170	107	1469-1482	85-98	7	6
20	171	108	1483-1496	99-112	8	6
21	172	109	1497-1510	113-126	9	6
22	173	110	1511-1523	127-139	10	6
23	174	111	1524-1537	140-153	11	6
24	175	112	1538-1551	154-167	12	6
25	176	113	1552-1565	168-181	13	6
26	177	114	1566-1579	182-195	14	6
27	178	115	1580-1593	196-209	15	6
28	179	116	1594-1607	210-223	16	6
29	180	117	1608-1621	224-237	17	6
30	181	118	1622-1635	238-251	18	6

Landsat-3

July 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	182	119	1636-1649	1- 14	1	7
2	183	120	1650-1663	15- 28	2	7
3	184	121	1664-1677	29- 42	3	7
4	185	122	1678-1691	43- 56	4	7
5	186	123	1692-1705	57- 70	5	7
6	187	124	1706-1719	71- 84	5	7
7	188	125	1720-1733	85- 98	7	7
8	189	126	1734-1747	99-112	8	7
9	190	127	1748-1761	113-126	9	7
10	191	128	1762-1774	127-139	10	7
11	192	129	1775-1788	140-153	11	7
12	193	130	1789-1802	154-167	12	7
13	194	131	1803-1816	168-181	13	7
14	195	132	1817-1830	182-195	14	7
15	196	133	1831-1844	196-209	15	7
16	197	134	1845-1858	210-223	16	7
17	198	135	1859-1872	224-237	17	7
18	199	136	1873-1886	238-251	18	7
19	200	137	1887-1900	1- 14	1	8
20	201	138	1901-1914	15- 28	2	8
21	202	139	1915-1928	29- 42	3	8
22	203	140	1929-1942	43- 56	4	8
23	204	141	1943-1956	57- 70	5	8
24	205	142	1957-1970	71- 84	6	8
25	206	143	1971-1984	85- 98	7	8
26	207	144	1985-1998	99-112	8	8
27	208	145	1999-2012	113-126	9	8
28	209	146	2013-2025	127-139	10	8
29	210	147	2026-2039	140-153	11	8
30	211	148	2040-2053	154-167	12	8
31	212	149	2054-2067	168-181	13	8

Landsat-3
August 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	213	150	2068-2081	182-195	14	8
2	214	151	2082-2095	196-209	15	8
3	215	152	2096-2109	210-223	16	8
4	216	153	2110-2123	224-237	17	8
5	217	154	2124-2137	238-251	18	8
6	218	155	2138-2151	1- 14	1	9
7	219	156	2152-2165	15- 28	2	9
8	220	157	2166-2179	29- 42	3	9
9	221	158	2180-2193	43- 56	4	9
10	222	159	2194-2207	57- 70	5	9
11	223	160	2208-2221	71- 84	6	9
12	224	161	2222-2235	85- 98	7	9
13	225	162	2236-2249	99-112	8	9
14	226	163	2250-2263	113-126	9	9
15	227	164	2264-2276	127-139	10	9
16	228	165	2277-2290	140-153	11	9
17	229	166	2291-2304	154-167	12	9
18	230	167	2305-2318	168-181	13	9
19	231	168	2319-2332	182-195	14	9
20	232	169	2333-2346	196-209	15	9
21	233	170	2347-2360	210-223	16	9
22	234	171	2361-2374	224-237	17	9
23	235	172	2375-2388	238-251	18	9
24	236	173	2389-2402	1- 14	1	10
25	237	174	2403-2416	15- 28	2	10
26	238	175	2417-2430	29- 42	3	10
27	239	176	2431-2444	43- 56	4	10
28	240	177	2445-2458	57- 70	5	10
29	241	178	2459-2472	71- 84	6	10
30	242	179	2473-2486	85- 98	7	10
31	243	180	2487-2500	99-112	8	10

Landsat-3
September 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	244	181	2501-2514	113-126	9	10
2	245	182	2515-2527	127-139	10	10
3	246	183	2528-2541	140-153	11	10
4	247	184	2542-2555	154-167	12	10
5	248	185	2556-2569	168-181	13	10
6	249	186	2570-2583	182-195	14	10
7	250	187	2584-2597	196-209	15	10
8	251	188	2598-2611	210-223	16	10
9	252	189	2612-2625	224-237	17	10
10	253	190	2626-2639	238-251	18	10
11	254	191	2640-2653	1- 14	1	11
12	255	192	2654-2667	15- 28	2	11
13	256	193	2668-2681	29- 42	3	11
14	257	194	2682-2695	43- 56	4	11
15	258	195	2696-2709	57- 70	5	11
16	259	196	2710-2723	71- 84	6	11
17	260	197	2724-2737	85- 98	7	11
18	261	198	2738-2751	99-112	8	11
19	262	199	2752-2765	113-126	9	11
20	263	200	2766-2778	127-139	10	11
21	264	201	2779-2792	140-153	11	11
22	265	202	2793-2806	154-167	12	11
23	266	203	2807-2820	168-181	13	11
24	267	204	2821-2834	182-195	14	11
25	268	205	2835-2848	196-209	15	11
26	269	206	2849-2862	210-223	16	11
27	270	207	2863-2876	224-237	17	11
28	271	208	2877-2890	238-251	18	11
29	272	209	2891-2904	1- 14	1	12
30	273	210	2905-2918	15- 28	2	12

Landsat-1
October 1978

Date	GMT Day	Flight Day	Spacecraft Orbits	Cycle Orbits	Cycle Day	Cycle
1	274	211	2919-2932	29- 42	3	12
2	275	212	2933-2946	43- 56	4	12
3	276	213	2947-2960	57- 70	5	12
4	277	214	2961-2974	71- 84	6	12
5	278	215	2975-2988	85- 98	7	12
6	279	216	2989-3002	99-112	8	12
7	280	217	3003-3016	113-126	9	12
8	281	218	3017-3029	127-139	10	12
9	282	219	3030-3043	140-153	11	12
10	283	220	3044-3057	154-167	12	12
11	284	221	3058-3071	168-181	13	12
12	285	222	3072-3085	182-195	14	12
13	286	223	3086-3099	196-209	15	12
14	287	224	3100-3113	210-223	16	12
15	288	225	3114-3127	224-237	17	12
16	289	226	3128-3141	238-251	18	12
17	290	227	3142-3155	1- 14	1	13
18	291	228	3156-3169	15- 28	2	13
19	292	229	3170-3183	29- 42	3	13
20	293	230	3184-3197	43- 56	4	13
21	294	231	3198-3211	57- 70	5	13
22	295	232	3212-3225	71- 84	6	13
23	296	233	3226-3239	85- 98	7	13
24	297	234	3240-3253	99-112	8	13
25	298	235	3254-3267	113-126	9	13
26	299	236	3268-3280	127-139	10	13
27	300	237	3281-3294	140-153	11	13
28	301	238	3295-3308	154-167	12	13
29	302	239	3309-3322	168-181	13	13
30	303	240	3323-3336	182-195	14	13
31	304	241	3337-3350	196-209	15	13

APPENDIX C

LANDSAT-3 DOCUMENTS ISSUED THIS REPORT PERIOD

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LANDSAT-3 DOCUMENTS ISSUED THIS REPORT PERIOD

<u>No.</u>	<u>Document No.</u>	<u>Title and Date</u>
1	14N5-L/3-214	Band 5 Second Outgas Cycle, Landsat-3, and Subsequent Operations, dated 11 May 1978.
2	14N5-L/3-215	Landsat-3 RBV, White Level Saturation and High Frequency Noise in Video Stream, dated 9 May 1978.
3	14N5-L/3-216	Band 5 Third Outgas Cycle, Landsat-3, and Subsequent Operations, dated 12 May 1978.
4	14N5-L/3-217	Landsat-3 ECAM Halt on Checksum, dated 17 May 1978.
5	14N5-L/3-218	Band 5 Fourth Outgas Cycle, Landsat-3, and Subsequent Operations, dated 6 June 1978.
6	14N5-L/3-219	Malfunction of Cell 4, Comstor B Landsat-3, dated 7 June 1978.
7	14N5-L/3-220	Band 5 Fifth Outgas Cycle, Landsat-3, and Subsequent Operations, dated 7 June 1978.
8	14N5-L/3-222	MSS Band 5 Landsat-3: Loss of Output from Sensor 25, dated 12 July 1978.
9	14N5-L/3-223	Sixth Outgas Cycle and Subsequent Orbits, dated 13 July 1978.
10	14N5-L/3-224	Seventh Outgas Cycle and Subsequent Operations, dated 14 July 1978.
11	14N5-L/3-225	Landsat-3 ECAM Halts in Flight dated 20 July 1978.